



Title	Contributions to the Halictid Fauna of the Eastern Palaearctic Region: Genus <i>Seladonia</i> Robertson (Hymenoptera: Halictidae, Halictinae)
Author(s)	Pesenko, Yuri A
Citation	ESAKIA    46    p53-82
Issue Date	2006-06-30
URL	<a href="http://hdl.handle.net/2324/2861">http://hdl.handle.net/2324/2861</a>
Right	

This document is downloaded at: 2012-10-12T16:18:22Z

## Contributions to the Halictid Fauna of the Eastern Palaearctic Region: Genus *Seladonia* Robertson (Hymenoptera: Halictidae, Halictinae)

Yuri A. PESENKO

Zoological Institute, Russian Academy of Sciences, 199034 St. Petersburg, Russia

**Abstract.** This paper presents the results of a taxonomic study of the bees of the genus *Seladonia* from the Eastern Palaearctic Region. Two new species, *S. leleji* sp. n. and *S. nikolskayae* sp. n. from the Primorskii Territory of Russia, are described. A new synonymy is established: *S. tumulorum feripennis* (Cockerell, 1929) = *S. tumulorum higashi* (Sakagami et Ebmer, 1979), syn. n. The taxonomic rank of *S. gobiensis* (Ebmer, 1982), originally described as a subspecies of *S. pseudovestita* (Blüthgen, 1925), is raised to specific status. The lectotypes of *Halictus semitectus* Morawitz, 1874; *H. mongolicus* Morawitz, 1880; *H. confluens* Morawitz, 1890 [= *S. aeraria* (Smith, 1873)] and *H. pjalmensis gascunicus* Blüthgen, 1935 are designated. Seven species, *S. aeraria* (Smith), *S. argilos* (Ebmer), *S. gobiensis* (Ebmer), *S. indefinita* (Blüthgen), *S. petraea* (Blüthgen), *S. pjalmensis* (Strand) and *S. placidula* (Blüthgen), are recorded from Mongolia for the first time. A total of 24 species of the genus *Seladonia* were found in the Eastern Palaearctic Region. A key to all species is given, except for the female of *S. opacoviridis* (Ebmer, 2005). An annotated list of the species includes data for each species on its synonymy, general geographical distribution, published records from the Eastern Palaearctic Region, and the material examined.

**Key words:** Halictidae, *Seladonia*, Eastern Palaearctic Region, taxonomy, key, distribution.

### Introduction

This paper is the fourth of a series treating the Eastern Palaearctic Halictidae. As defined in the first paper of the series (Pesenko, 2005), the Eastern Palaearctic Region is considered the part of Asia located eastwards from about 90° E and northwards from about 35° N (in China; 32° N in Japan). This territory includes Eastern Siberia (Siberia east of the Yenisei River, from Tuva in the south), the Russian Far East (including Sakhalin Island and the Kuril Islands), Mongolia, the north (northern half of Qinghai, Gansu and Shaanxi, Neimenggu, Ningxia, Shanxi) and northeast (Hebei, Shandong, Liaoning, Jilin and Heilongjiang) of China, the Korean Peninsula, and Japan with the exclusion of the Ryukyu (Nansei) Islands.

### Genus *Seladonia* Robertson, 1918

The genus *Seladonia* in the volume as defined by

Pesenko (2000, 2004), which includes *Vestitohalictus* Blüthgen, 1961, is almost a cosmopolitan group of bees in relation to distribution (absent in Australia). It includes 102 currently recognized species, three-fourths of which (72 species) are Palaearctic; only 8 species inhabit America, including the Holarctic *S. confusa* (Smith, 1853), while 14 species are known from the Afrotropical Region and 9 species occur in the Oriental Region. The majority of species are Mediterranean and Central Asian, preferring deserts and semi-deserts.

All of the 14 behaviorally known species of the genus are primitively eusocial. All species are polyleges, usually with a certain preference for Asteraceae, and construct nests in soil. Most prefer warm dry areas for nesting, and avoid overgrown places. Females construct nests with sessile cells often arranged into groups.

This genus is a sister group with respect to the Holarctic genus *Halictus* Latreille (Pesenko, 2004), and differs from the latter in the metallic green or blue-green coloration in both sexes and the presence of a medial

lobe of the upper gonostylus of the male. The genus was subdivided by the author into 6 subgenera (Pesenko, 2004).

**Subgenus *Mucoreohalictus*** Pesenko, 2004: 102. Type species: *Hylaeus mucoreus* Eversmann, 1852. The subgenus corresponds to the *Halictus* (*Vestitohalictus*) *mucoreus* and *H. (V.) radoszkowskii* species-groups of Blüthgen (1955, 1961) and Ebmer (1975) combined. It is distributed in the Southern Palaearctic Region, includes 15 species.

**Subgenus *Pachyceble*** Moure, 1940: 54. Type species: *Pachyceble lanei* Moure, 1940, by original designation. The subgenus corresponds to the *Halictus* (*Seladonia*) *tumulorum* and *H. (S.) leucaheneus* species-groups of Ebmer (1988a) combined. It is nearly cosmopolitan in occurrence, absent in Australia; includes 25 species.

**Subgenus *Paraseladonia*** Pauly, 1997: 92. Type species: *Halictus chalybeatus* Friese, 1909, by original designation. It includes a single cleptoparasitic species, occurring in the Afrotropical Region.

**Subgenus *Placidohalictus*** Pesenko, 2004: 102. Type species: *Halictus placidus* Blüthgen, 1923, by original designation. The subgenus partly corresponds to the *Halictus* (*Seladonia*) *varentzowi* species-group of Ebmer (1988a). It includes also *S. desertorum*, which was not included by the last author in any group of *Seladonia*, *S. bulbiceps* and *S. fuscicollis*, which were considered by Michener (1978) as members of *Halictus* subg. *Vestitohalictus*. It is distributed in Central Asia, includes 5 species.

**Subgenus *Seladonia*** Robertson, 1918: 91. Type species: *Apis seladonia* Fabricius, 1794, by original designation. The subgenus corresponds to the *Halictus* (*Seladonia*) *seladonius*, *H. (S.) smaragdulus*, and *H. (S.) gemmeus* species-groups of Ebmer (1988a) combined. It is distributed in the Old World, except for Australia, includes 38 species.

**Subgenus *Vestitohalictus*** Blüthgen, 1961: 287. Type species: *Halictus tectus* Radoszkowski, 1876, fixed by Pesenko, 2004: 102 (under Article 70.3 of the Code). The subgenus corresponds to the *Halictus* (*Vestitohalictus*) *vestitus* species-group of Blüthgen (1955, 1961) and Ebmer (1975). It is distributed in the Southern Palaearctic Region, includes 16 species.

### Published records

The information (original data) on the occurrence of the species above in the Eastern Palaearctic Region

is contained in the following publications arranged by chronology:

- Smith, 1873-*S. aeraria* from Japan (Honshu);  
 Morawitz, 1880-“*Halictus varipes*” = *S. lucidipennis* and *S. mongolica* from Mongolia;  
 Morawitz, 1890-“*Halictus confluentis*” = *S. aeraria*, *S. pulvereae*, and *S. tumulorum* from China;  
 Strand, 1910-“*Halictus pseudoconfluentis*” = *S. aeraria* from China (Shandong);  
 Cockerell, 1911-“*Halictus nikkoensis*” = *S. aeraria* from Japan (Honshu);  
 Friese, 1916-“*Halictus tsushima*” = *S. aeraria* from Japan (Tsushima);  
 Blüthgen, 1923a-*S. mondaensis* from Russia (Buryatia);  
 Cockerell, 1924-“*Halictus eruditus*” = *S. aeraria* and *S. tumulorum* from Russia (Primorskii Territory);  
 Blüthgen, 1925-*S. pseudovestita* from China (Beijing);  
 Blüthgen, 1929-*S. mongolica* from China Qinghai);  
 Cockerell, 1929-“*Halictus ferripennis*” = *S. tumulorum* from Russia (Irkutsk Province);  
 Gussakovskij, 1932-*S. aeraria* and “*Halictus daturae*” = *S. tumulorum* from Russia (Primorskii Territory);  
 Blüthgen, 1933a-*S. transbaikalis* from Russia (“Süd-Transbaikalien”);  
 Blüthgen, 1934a-*S. aeraria*, *S. semitecta*, and *S. tumulorum* from China (Gansu); “*Halictus fasciatus*” = *S. leucahenea* from Russia (Yakutia), and China (Gansu);  
 Yasumatsu, 1934-*S. aeraria* from Japan (Yakushima);  
 Blüthgen, 1935a-*S. pjalmensis* from China (Gansu);  
 Yasumatsu & Narisada, 1935-*S. aeraria* from China (Liaoning);  
 Yasumatsu, 1937-*S. aeraria* from Japan (Tsushima);  
 Okabe, 1939-*S. aeraria* from China (“Nordmandschurei”);  
 Blüthgen, 1955-“*Halictus varipes*” = *S. lucidipennis* from China (Gansu);  
 Sakagami & Fukuda, 1972-*S. tumulorum* from Japan (Hokkaido);  
 Fukuda et al., 1973-*S. tumulorum* from Japan (Hokkaido);  
 Sakagami & Fukuda, 1973-*S. tumulorum* from Japan (Hokkaido);  
 Usui et al., 1976-*S. tumulorum* from Japan (Hokkaido);  
 Ebmer, 1978a-*S. aeraria*, *S. leucahenea*, and *S. pseudovestita* from China (Heilongjiang); *S. tumulorum* from Russia (Primorskii Territory) and China (Heilongjiang);

Ebmer, 1978c-*S. aeraria* and *S. tumulorum* from North Korea;  
 Ikudome, 1978-*S. aeraria* from Japan (Shikoku);  
 Sakagami & Ebmer, 1979-*S. tumulorum* from Japan;  
 Ikudome, 1981-*S. aeraria* from Japan (Shikoku);  
 Ebmer, 1982-*S. dorni*, *S. leucahenea*, *S. mondaensis*, *S. mongolica*, *S. pollinosa*, *S. pulvereae*, *S. semitecta*, and *S. tumulorum* from Mongolia; *S. pseudovestita* from Mongolia and China; *S. transbaikalisensis* from China;  
 Ebmer, 1985a-*S. leucahenea* from Russia (Irkutsk Province);  
 Ebmer, 1988a-*S. dorni* and *S. mondaensis* from Mongolia; *S. leucahenea* from China; *S. transbaikalisensis* from Russia (Irkutsk Province) and Mongolia; *S. tumulorum* from Russia (Sakhalin), North Korea; China; and Japan;  
 Hirashima, 1989-*S. aeraria* and *S. tumulorum* from Japan;  
 Yamada et al., 1990-*S. aeraria* and *S. tumulorum* from Japan (Honshu);  
 Fan, 1991-*S. leucahenea* from China;  
 Ikudome, 1992-*S. aeraria* from Japan (Kyushu);  
 Ikudome & Nakamura, 1994-*S. aeraria* from Japan (Honshu);  
 Ikudome & Nakamura, 1995-*S. aeraria* from Japan (Honshu);  
 Ebmer, 1996-*S. aeraria*, *S. confusa*, and *S. tumulorum* from Russian Far East; *S. gavarnica* from Russia (Primorskii Territory) and Mongolia;  
 Ikudome & Nakamura, 1996-*S. aeraria* from Japan (Honshu);  
 Ikudome & Nakamura, 1997-*S. aeraria* from Japan (Honshu);  
 Iwata, 1997-*S. aeraria* from Japan (Kyushu);  
 Kim, 1997-*S. aeraria* and *S. tumulorum* from South Korea;  
 Dawut & Tadauchi, 2000-*S. aeraria* from Japan; *S. leucahenea* from Mongolia (Bayan-Hongor);  
 Dawut & Tadauchi, 2002-*S. dorni* and *S. mongolica* from Mongolia (Bayan-Hongor); *S. semitecta* from Mongolia (Bayan-Hongor and Uvs); *S. tumulorum* from Japan (Hokkaido);  
 Proshchalykin, 2003-*S. confusa* from Russia (Kunashir);  
 Pesenko & Davydova, 2004-*S. confusa* and *S. leucahenea* from Russia (Eastern Siberia and Far East) and Mongolia; *S. mondaensis* from Russia (Tuva, Yakutia);  
 Proshchalykin, 2004-*S. aeraria*, *S. confusa*, *S. leucahenea*, and *S. tumulorum* from south of Russian Far East;  
 Proshchalykin et al., 2004-*S. tumulorum* from Russia

(Sakhalin);

Ebmer, 2005-*S. dorni*, *S. leucahenea*, *S. mugodjarica*, *S. pulvereae*, *S. semitecta*, and *S. transbaikalisensis* from Mongolia; *S. confusa* from Mongolia and China; *S. tumulorum* from Mongolia and South Korea; *S. argilos* and *S. opacoviridis* from China; *S. mongolica* from Russia (Buryatia) and Mongolia;

Proshchalykin & Kupianskaya, 2005-*S. confusa*, *S. mondaensis*, and *S. tumulorum* from Russia (Magadan Province).

## Material and methods

Most of the material examined (collection totaling more than 3000 specimens) is deposited at ZISP (see below for an explanation of abbreviations). A number of bees were provided for study by IBSV and ZMMU.

Twenty-four species of the genus *Seladonia* can be considered inhabitants of the Eastern Palaearctic Region: *S. aeraria* (Smith), *S. argilos* (Ebmer), *S. confusa* (Smith), *S. dorni* (Ebmer), *S. gavarnica* (Pérez), *S. gobiensis* (Ebmer), *S. indefinita* (Blüthgen), *S. leleji* sp. n., *S. leucahenea* (Ebmer), *S. lucidipennis* (Smith), *S. mondaensis* (Blüthgen), *S. mongolica* (Morawitz), *S. mugodjarica* (Blüthgen), *S. nikolskayae* sp. n., *S. opacoviridis* (Ebmer), *S. petraea* (Blüthgen), *S. pjalmensis* (Strand), *S. placidula* (Blüthgen), *S. pollinosa* (Sichel), *S. pseudovestita* (Blüthgen), *S. pulvereae* (Morawitz), *S. semitecta* (Morawitz), *S. transbaikalisensis* (Blüthgen) and *S. tumulorum* (Linnaeus).

The records of alpine *S. confusa alpina* (Alfken), Middle Asian *S. varentzowi* (Morawitz), Western Palaearctic *S. seladonia* (Fabricius), and *S. subaurata* (Rossi) from northern and eastern China, as published by Niu et al. (2004), are based on misidentification. The publication of Niu et al. (2004) is not taken into consideration in the present communication.

The following abbreviations are used in the key to species shown below: S, metasomal sternum; T, metasomal tergum; e.g. T1 means tergum 1; S4, sternum 4, using metasomal (not abdominal) numeration. The following "formula" is used for a description of punctuation: interval of (typical) puncture diameters in µm and intervals of (typical) interspaces width estimated in the number of average puncture diameters (in parentheses), e.g. 28-35 µm / (2-3).

I failed to include the female of *S. opacoviridis* in the key, recently described by Ebmer (2005) from northern and northeastern China. This species belongs to the *S. leucahenea* group; however, according to the original description, the female of this species is similar to small

members of the *S. tumulorum* group.

In the annotated list below, species provided within the sections "Published records" and "Material examined" only include data from the Eastern Palaearctic Region. The traditional term "Middle Asia" is used in Russian references as a name for the combined territory occupied by Turkmenistan, Uzbekistan, Tajikistan and Kyrgyzstan. The words "Province" in the names of administration districts in North Korea, "Province", "Autonomous Region" and "Municipality" in the names of administration districts in China, "Aimak" in the names of administration districts in Mongolia, "Island" for Sakhalin, Kurils (Iturup, Kunashir, Urup, etc.) and Japanese Islands, are omitted.

The following abbreviations are used in the text to represent museums, institutions and private collections acting as depositaries for types and other material examined:

**BML**-British Museum of Natural History, London, Great Britain (curator G.R. Else);

**DEI**-Deutsches entomologisches Institut, Eberswalde (at present in Müncheberg), Germany (curator H.H. Dathe);

**EBM**-private collection of Andreas W. Ebmer, Linz, Austria;

**ECC**-Entomological Collection of Ministry of Agriculture, Cairo, Egypt;

**FAHUS**-Faculty of Agriculture, Hokkaido University, Sapporo, Japan;

**IBSV**-Institute of Biology and Soil Sciences, Russian Academy of Sciences, Vladivostok, Russia (curator A.S. Lelej);

**IZK**-Institute of Systematic and Experimental Zoology, Polish Academy of Sciences, Krakow, Poland (curator W. Celary);

**MCG**-Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy (curator R. Poggi);

**MNB**-Museum für Naturkunde an der Humboldt Universität zu Berlin, Germany (curator F. Koch);

**MNP**-Muséum National d'Histoire Naturelle, Paris, France (curator J. Casevitz-Weulersse);

**NMW**-Naturhistorisches Museum, Wien, Austria (curator M. Fischer);

**OLML**-Oberösterreichs Landesmuseum, Linz, Austria (curator F. Gusenleitner);

**SCH**-Private collection of Maximilian Schwarz; Ansfelden by Linz, Austria;

**USMW**-U. S. National Museum of Natural History, Smithsonian Institution, Washington, USA (curator R.J. McGinley);

**ZISP**-Zoological Institute, Russian Academy of Sci-

ences, St. Petersburg (curator Yu.A. Pesenko);

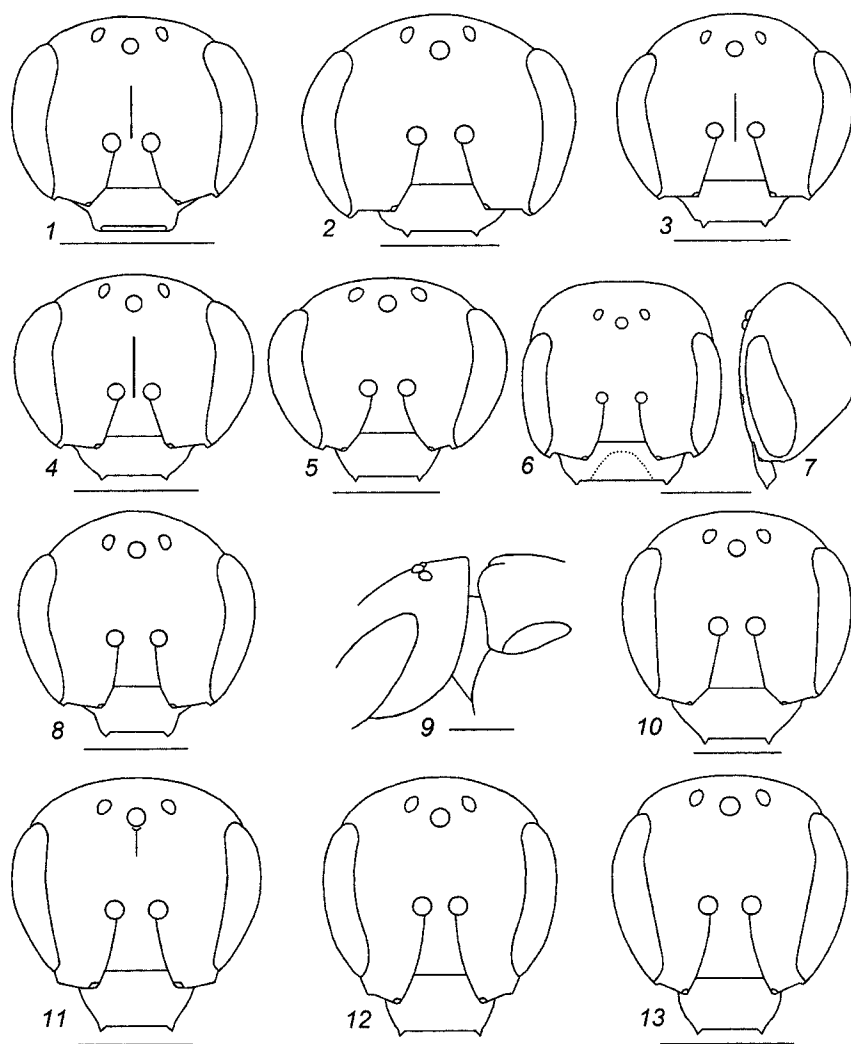
**ZMMU**-Zoological Museum, Moscow University, Moscow, Russia (curator A.V. Antropov);

**ZSUH**-Zoologische Sammlung, Universität Halle, Germany.

### A key to the Eastern Palaearctic species

1. .... 2
- ..... 22
- 2 (1). Body entirely covered with dense pale tomentum concealing underlying surfaces (sometimes mesoscutum less densely pubescent), except for bare metapostnotum. Metapostnotum very short, shorter than metanotum, not reaching posterior margin of dorsal surface of propodeum. Metabasitibial plate ill-defined, its anterior border not marked ..... 3
- Body without or with sparse tomentum on most of surfaces; except for *S. mongolica* and *S. pjalmensis gaschunica*, in which metasoma entirely covered with dense tomentum. Metapostnotum usual, as long as or longer than metanotum, reaching posterior margin of dorsal surface of propodeum. Metabasitibial plate well-defined, its anterior border distinct as well as posterior one ..... 8
- 3 (2). Body black, without metallic tints ..... 1. *S. (Mucoreohalictus) indefinita* (Blüthgen)
- At least, head and mesosoma metallic green ..... 4
- 4 (3). Larger, body length 8.5-9.0 mm. Inner metatibial spur pectinate, with 6-7 thin long teeth, separated each other (Fig. 19) ..... 2a. *S. (Mucoreohalictus) pollinosa cariniventris* (Morawitz)
- Smaller, body length not more than 8.0 mm. Inner metatibial spur dentate, with 3-5 wide rounded triangular teeth adjoined by their bases (Fig. 20) ..... 5
- 5 (4). Smaller, body length 4.8-5.0 mm. Clypeus at lower margin with transverse groove, without lateral tooth (Fig. 1) ..... 14. *S. (Placidohalictus) placidula* (Blüthgen)
- Larger, body length 6-8 mm. Clypeus uniformly convex, without transverse groove, with lateral tooth (as in all species of *Halictus* and most of *Seladonia*) ..... 6
- 6 (5). Larger, body length 7.5-8.0 mm. Head and mesosoma partly and metasoma entirely brownish, with light green tint, sometimes weak. Head very wide, 1.2-1.25 times as wide as high (Fig. 2), 1.2 times as wide as mesosoma. Clypeus projecting below eyes by 1/3 of its height or less (Fig. 2). Mesoscutum and scutellum covered with dense pale tomentum concealing underlying surface .....

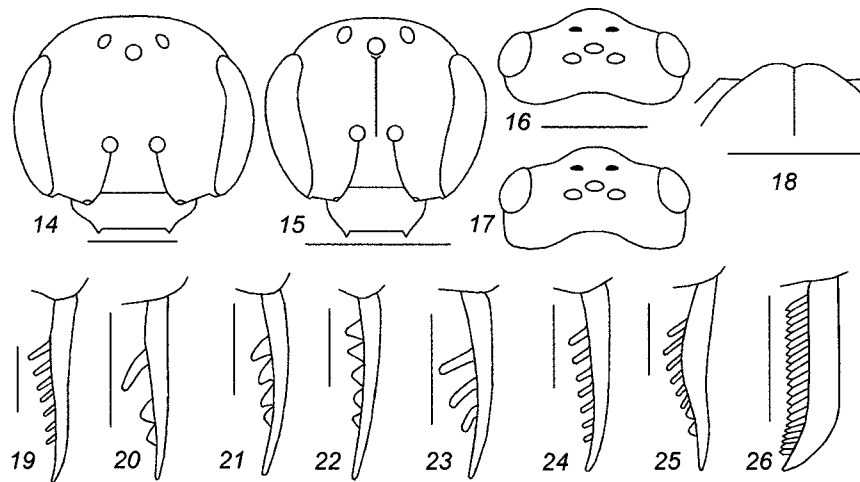




**Figs. 1-13. *Seladonia*, females:** 1-6, 8, 10-13, head in front view; 7, head in lateral view; 9, head and anterior part of mesosoma in lateral view.  
1, *S. placidula*; 2, *S. gobiensis*; 3, *S. pulverea*; 4, *S. mongolica*; 5, *S. pjalmensis gaschunica*; 6, 7, *S. aeraria*; 8, 9, *S. leucahenea leucahenea*; 10, *S. argilos*; 11, *S. mondaensis*; 12, *S. petraea*; 13, *S. transbaikalis*.  
Scale bars mean 1 mm.

- ..... 22. *S. (Vestitohalictus) gobiensis* (Ebmer)
- Smaller, body length 6-7 mm. Body entirely metallic green, except for horn-yellow translucent posterior areas of metasomal terga. Head higher, 1.05-1.1 times as wide as high (Fig. 3), weakly wider than mesosoma. Clypeus projecting below eyes by 2/3 of its height or more (Fig. 3). Mesoscutum and scutellum covered with less dense pubescence of erect plumose hairs, not concealing underlying surface ..... 7
  - 7 (6). Metapostnotum medially longer than rest (densely pubescent) dorsal surface of propodeum ..... 7
  - ..... 24. *S. (Vestitohalictus) pulverea* (Morawitz)
  - Metapostnotum medially shorter than rest (densely pubescent) dorsal surface of propodeum .....

- ..... 23. *S. (Vestitohalictus) pseudovestita* (Blüthgen)
- 8 (2). Metasomal terga entirely covered with dense pale tomentum (as in species of subgenera *Mucoreohalictus* and *Vestitohalictus*). Legs light brownish-orange, with extensive yellow pattern. Clypeus brown, without metallic tints. Head triangular in front view, wider than high, with clypeus strongly projecting below eyes (Figs. 4, 5) .....
  - 9
  - Metasomal terga only with posterior and sometimes anterior bands of appressed plumose hairs, except for *S. dorni*, *S. semitecta* and *S. transbaikalis*, in which T3 and T4 on discs entirely covered with dense or sparse tomentum. Legs usually black or fuscous, without yellow pattern. Clypeus usually metallic



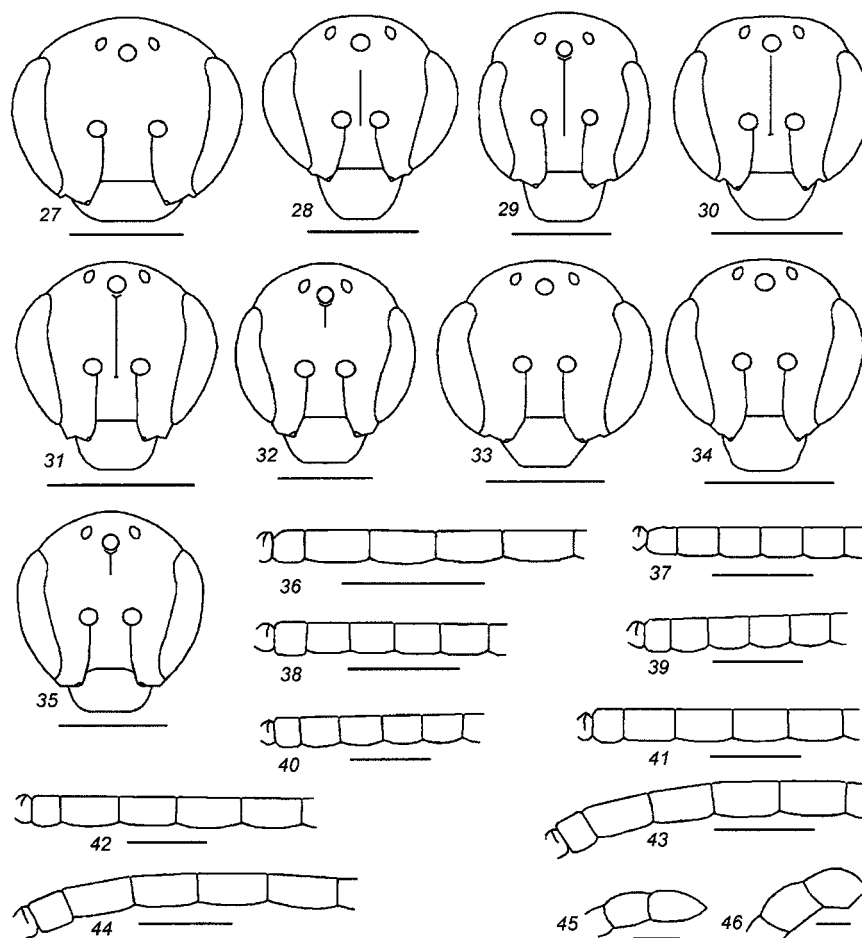
**Figs. 14-26. *Seladonia*, females:** 14, 15, head in front view; 16, 17, head in dorsal view; 18, anterior part of mesoscutum in dorsal view; 19-26, inner metatibial spur.

14, *S. lucidipennis*; 15, *S. semitecta*; 16, *S. tumulorum ferripennis*; 17, *S. confusa pelagia*; 18, *S. argilos*; 19, *S. pollinosa cariniventris*; 20, *S. placidula*; 21, *S. gobiensis*; 22, *S. pseudoves-tita*; 23, *S. mongolica*; 24, *S. pjalmensis gaschunica*; 25, *S. leucahenea leucahenea*; 26, *S. ar-gilos*.

Scale bar means 1 mm for Figs. 15-18, 0.25 mm for Figs. 19-26.

- green or black, with green tint ..... 10
- 9 (8). Smaller, body length 5.5-6.0 mm. Lower third of clypeus, supraclypeal area, metasoma nearly throughout and also sometimes other parts of head and mesosoma brown, without or with weak metallic tint. Mesoscutum nearly without appressed pubescence, sparsely punctate, with distinct shiny interspaces. Metapostnotum uniformly finely granulate-alveolate. Inner metatibial spur with 3-4 long teeth, not adjoined by their bases (Fig. 23) ..... 17. *S. (Seladonia) mongolica* (Morawitz)
- Larger, body length 7.0-7.5 mm. Head (except for black or fuscous clypeus), mesosoma entirely, and metasoma (except for horn-yellow translucent posterior areas of terga light metallic green. Mesoscutum covered with rather dense, but not concealing underlying surface, densely punctate, slightly shiny. Metapostnotum with wide polished stripe along posterior margin. Inner metatibial spur with 7 small teeth (Fig. 24) ..... 20a. *S. (Seladonia) pjalmensis gaschunica* (Blüthgen)
- 10 (8). Body brightly bronze-green. Head nearly cubical, with strongly enlarged genal areas and vertex; higher than wide; its proportions being in strong allometric dependence on body size: in larger individuals (gynes, body length 8-9 mm), head elongate right-angular in front view (Fig. 6), genal area 3 times as wide as eye in lateral view to head (Fig. 7); in smaller individuals (workers, body length

- 5-6 mm), head nearly round in front view, genal area 1.5 times as wide as eye in lateral view to head. Clypeus with shallow triangular depression, more distinct in smaller individuals. Mandibles long, crossing one another. Posterior vertical surface of propodeum carinate along its border with lateral surfaces ..... 15. *S. (Seladonia) aeraria* (Smith)
- Body metallic green, blue-green, or black, with deep blue tint, usually without bronze tint. Head thinner, egg-shaped or rounded triangular in front view. Clypeus without depression ..... 11
- 11 (10). Mesoscutum distinctly depressed along admedian line, strongly emarginate in middle of anterior margin (Figs. 9, 18). Upper parts of lateral and posterior vertical surfaces of propodeum smooth, shiny or silk-mat. T1 on slanting and dorsal surfaces with large lateral spots, sometimes merging, of whitish semi-appressed hairs. T2-T4 with wide posterior bands, occupying nearly half of terga lengths, of pale appressed hairs ..... 12
- Mesoscutum not depressed along admedian line, not or slightly emarginate in middle of anterior margin. Sculpture of propodeum varying. T1 without lateral hair spot on slanting and dorsal surfaces (except for *S. dorni*). T2-T4 with less wide posterior hair bands, frequently narrowed medially ..... 13
- 12 (11). Head relatively short (distinctly wider than high; Fig. 8) and thin (narrower than eye, in lateral view to head), nearly as wide as mesosoma. Vertex



**Figs. 27-46. *Seladonia*, males:** 27-35, head in front view; 36-44, 1st-5th flagellomeres, lateral view; 45, 46, 10-11th flagellomeres, lateral view.

27, *S. gobiensis*; 28, *S. pulverea*; 29, 36, *S. aeraria*; 30, 37, *S. lucidipennis*; 31, 38, *S. mongolica*; 32, 39, *S. nikolskayae*; 33, 40, *S. pjalmensis gaschunica*; 34, 41, *S. semitecta*; 35, 42, *S. leleji*; 43, *S. leucahenea leucahenea*; 44, *S. tumulorum ferripennis*; 45, *S. indefinita*; 46, *S. polinosa cariniventris*.

Scale bar means 1 mm for Figs. 27-35, 0.5 mm for Figs. 36-46.

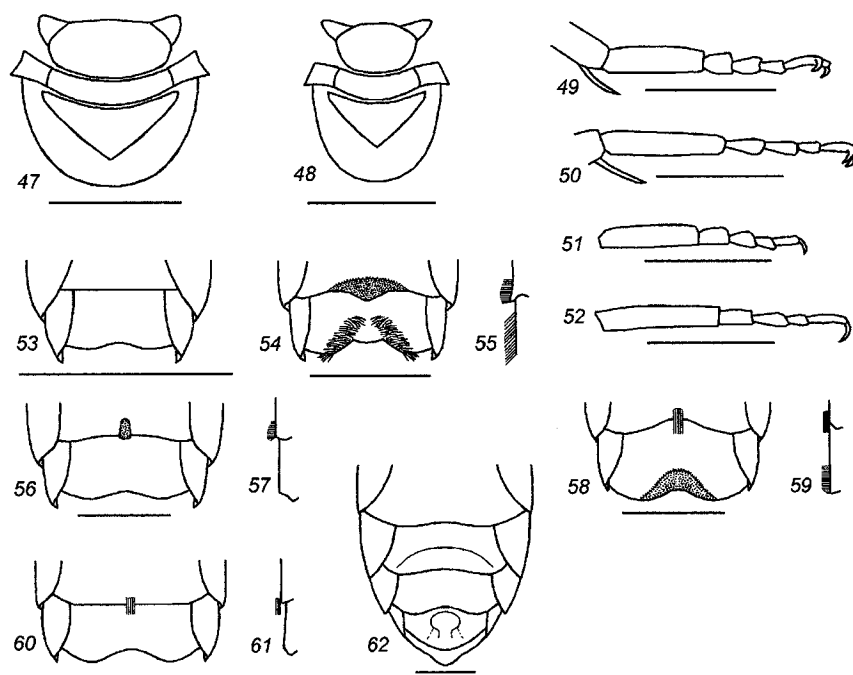
strongly flattened, nearly sharp along posterior (upper) margin (Fig. 9). Mandible relatively short, its subapical tooth small, situated close by distal end of mandible. Mesosoma on upper surface pubescent with long yellow brownish or rusty hairs. Metapostnotum finely sculptured, nearly finely granulate. Inner metatibial spur pectinate, with 7-9 teeth distinctly separated each other at their bases (Fig. 25). Metasomal terga black on discs, with weak, but distinct yellowish green metallic tint; their posterior areas dark. T2 and T3 without anterior hair bands. T4 on disc with inconspicuous dark hairs. Body length 7-8 mm .....

- 8a. *S. (Pachyceble) leucahenea leucahenea* (Ebmer)  
– Head as high as wide or somewhat higher than wide (Fig. 10) and more massive: thick (genal area wider eye, in lateral view to head), wider than mesosoma.

Vertex not flattened, widely rounded along posterior (upper) margin. Mandible long, crossing; its subapical tooth large, situated far from distal end of mandible. Mesosoma on upper surface pubescent with short whitish hairs. Metapostnotum more coarsely finely sculptured, alveolate rugose. Inner metatibial spur with about 20 small narrow teeth tightly adjoined each other (Fig. 26). Metasomal terga brown on discs, with green metallic tint only on their anterior third; their posterior areas horn-yellow translucent. T2 and T3 with wide anterior bands of dense hairs. T4 on disc covered throughout with dense whitish tomentum. Body length 6.5-7.0. Male unknown .....

- ..... 3. *S. (Pachyceble) argilos* (Ebmer)  
13 (11). Body black, with deep blue or dark green metallic tint on head and mesosoma, sometimes very weak





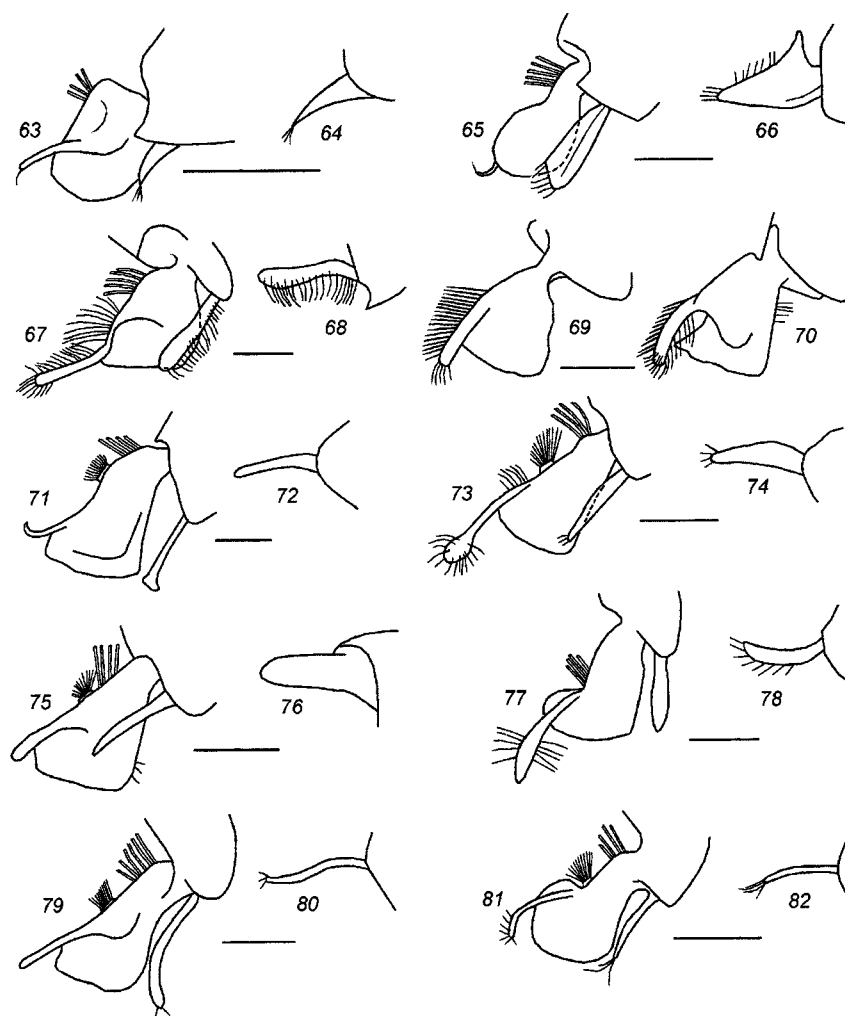
**Figs. 47-62. *Seladonia*, males:** 47, 48, posterior half of mesosoma, dorsal view; 49-52, hind tarsus; 53, 54, 56, 58, 60, S4 and S5, ventral view; 55, 57, 59, 61, S4 and S5, lateral view; 62, S3-S6, ventral view.

47, 49, *S. nikolskayae*; 48, 50, *S. leleji*; 51, *S. gavarnica* (from Ebmer, 1982: 203); 52, *S. transbaikalensis* (from Ebmer, 1982: 203); 53, *S. placidula*; 54, 55, *S. indefinita*; 56, 57, *S. pollinosa cariniventris*; 58, 59, *S. gobiensis*; 60, 61, *S. pulverea*; 62, *S. mondaensis*.

Scale bar means 1 mm.

- ..... 14
- At least, head and mesosoma metallic green (in *S. dorni* black, with strong yellow tint). Posterior bands of T1-T4 normal: consisting of dense appressed hairs; band of T1 sometimes interrupted medially. T1 distinctly and relatively densely punctate ..... 15
- 14 (13). Head and mesosoma with deep blue tint. Head as high as wide or somewhat higher than wide (Fig. 11). T1 sparsely obscurely punctate. T1-T4 with weakly developed posterior hair bands. Body length 7.0-7.5 mm ..... 14
- ..... 9. *S. (Pachyceble) mondaensis* (Blüthgen)
- Head and mesosoma with dark green or dark greenish blue tint. Head 1.1-1.15 times as high as wide (Fig. 12). T1 finely, distinctly and densely punctate. T1-T4 with dense white posterior hair bands. Body length 7.0-7.5 mm. Male unknown ..... 15
- ..... 11. *S. (Pachyceble) petraea* (Blüthgen)
- 15 (13). Head 1.05-1.1 times as high as wide (Fig. 13). Body length 6.5-7.0 mm ..... 16
- Head 1.05-1.1 times as wide as high (except for *S. semitecta*, in which head egg-shaped, about as wide as high, but body smaller, length 5.0-5.5 mm) ..... 18
- 16 (15). Genal areas in dorsal view to head stronger

- convex, their outer margins parallel-sided (as in *S. tumulorum*; see Fig. 16). Dorsal surface of propodeum entirely mat. Posterior hair bands of T2 and T3 narrowed medially. Discs of T3 and T4 with inconspicuous pubescence. Body length 6.5-7.0 mm ..... 17
- ..... 6. *S. (Pachyceble) gavarnica* (Pérez)
- Genal areas in dorsal view to head less convex, their outer margins convergent backward (as in *S. confusa*; see Fig. 17). Metapostnotum with wide shiny stripe along its posterior margin. Posterior hair bands of T2 and T3 not narrowed. T3 and T4 on discs covered with tomentum (sparser than in *S. semitecta*) ..... 17
- 17 (16). Body black, with strong greenish yellow metallic tint. Mesoscutum more coarsely (20-25  $\mu$ m) and more sparsely punctate, with distinct polished interspaces. Metapostnotum coarser alveolate-wrinkled, shiny. Body length 6.5 mm ..... 17
- ..... 5. *S. (Pachyceble) dorni* (Ebmer)
- Body metallic green, without yellow tint. Mesoscutum twice less coarsely punctate, mat. Metapostnotum with fine dense sculpture, nearly granulate, mat. Body length 6.5 mm ..... 18
- ..... 12. *S. (Pachyceble) transbaikalensis* (Blüthgen)
- 18 (15). Smaller on average, body length 5.0-6.5 mm.



**Figs. 63-82. *Seladonia*, males:** 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, upper gonostylus, postero-dorsal view to genital capsule; 64, 66, 68, 72, 74, 76, 78, 80, 82, lower gonostylus, postero-lateral view to genital capsule; 70, upper gonostylus, postero-lateral view to genital capsule. 63, 64, *S. placidula*; 65, 66, *S. indefinita*; 67, 68, *S. pollinosa cariniventris*; 69, 70, *S. gobiensis*; 71, 72, *S. aeraria*; 73, 74, *S. lucidipennis*; 75, 76, *S. mongolica*; 77, 78, *S. nikolskayae*; 79, 80, *S. pjalmensis gaschunica*; 81, 82, *S. semitecta* (from Ebmer, 1988: 327). Scale bar means 0.2 mm.

Body with more light metallic green coloration, more sparsely punctate, usually with shiny interspaces. Dorsal surface of propodeum shorter than scutellum. Posterior vertical and lateral surfaces of propodeum polished, at least in upper half. Legs with extensive light brown or yellow pattern. Metasoma strongly pubescent, T2 and T3 with anterior bands or/and T3 and T4 covered with dense tomentum ..... 19

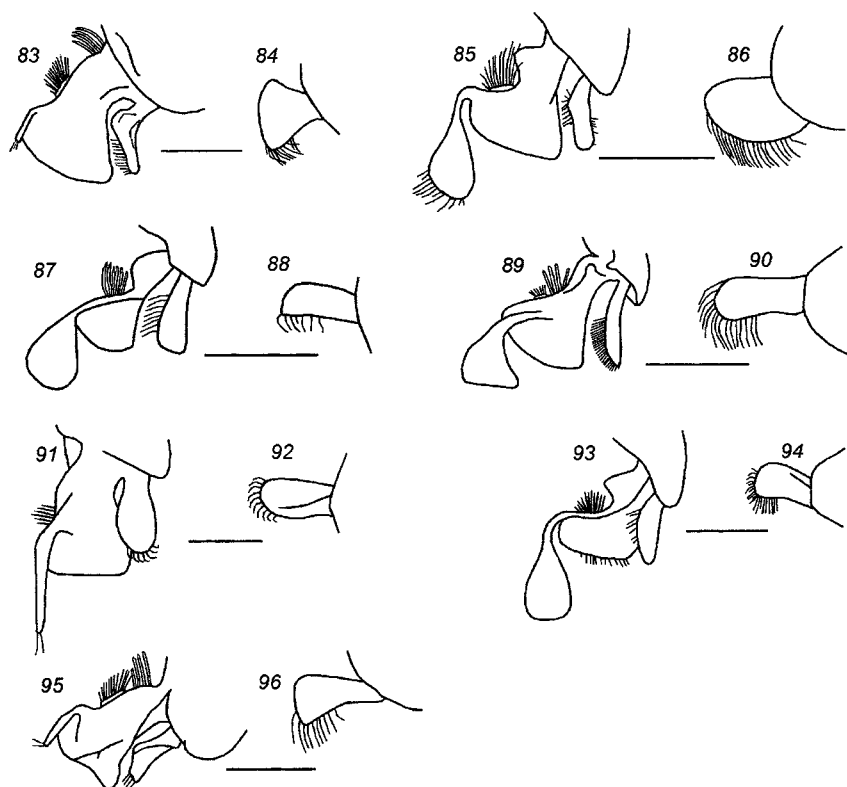
– Larger on average, body length 6.5-7.5 mm. Body darker, dark green, deep blue, or black, with deep-blue metallic tint on head and mesosoma; more densely punctate, more mat. Dorsal surface of propodeum as long as or longer than scutellum. Posterior vertical and lateral surfaces of propodeum mat. Legs entirely

black or dark brown. Metasoma with much weaker pubescence ..... 21

19 (18). Head rounded in front view (as high as wide; Fig. 14) or transversely elliptic (slightly wider than high), distinctly wider than mesosoma, thick. T3 and T4 with inconspicuous pubescence on discs, only with narrow anterior bands. A very variable species owing to caste differences between gynes and workers. Body length 5.0-6.5 mm ..... 16. *S. (*Seladonia*) lucidipennis* (Smith)

– Head egg-shaped or shortly triangular in front view owing to clypeus more strongly projecting below eyes. At least, T4 entirely covered with tomentum .. 20

20 (19). Head egg-shaped in front view, about as high as



**Figs. 83-96. *Seladonia*, males:** 83, 85, 87, 89, 91, 93, 95, upper gonostylus, postero-dorsal view to genital capsule; 84, 86, 88, 90, 92, 94, 96, lower gonostylus, postero-lateral view to genital capsule.  
83, 84, *S. confusa pelagia*; 85, 86, *S. dorni* (from Ebmer, 2005: 385); 87, 88, *S. leleji*; 89, 90, *S. leucahenea leucahenea*; 91, 92, *S. mondaensis*; 93, 94, *S. opacoviridis* (from Ebmer, 2005: 386); 95, 96, *S. tumulorum ferripennis*.  
Scale bar means 0.2 mm.

- wide (Fig. 15). T3 and T4 entirely covered with dense tomentum. Body length 5.0-5.5 mm ..... 21. *S. (Seladonia) semitecta* (Morawitz)
- Head shortly triangular in front view, 1.15 times as wide as high. Only T4 with not dense tomentum. Body length 6 mm. Male unknown ..... 18. *S. (Seladonia) mugodjarica* (Blüthgen)
- 21 (18). Genal areas in dorsal view to head stronger convex, their outer margins parallel-sided (Fig. 16). Metasoma metallic green or blue. T1 on convex surface without lateral spot of appressed hairs. T4 with narrow posterior hair band ..... 13a. *S. (Pachyceble) tumulorum ferripennis* (Cockerell)
- Genal areas in dorsal view to head less convex, their outer margins convergent backward (Fig. 17). Metasoma brownish, with green or bronze metallic tint. T1 on convex surface with large lateral spot of appressed hairs. T4 with wide posterior hair band, occupying entirely posterior area of tergum and triangularly broadened medially forward .....

- ..... 4a. *S. (Pachyceble) confusa pelagia* (Ebmer)
- 22 (1). Body entirely covered with dense pale tomentum concealing underlying surfaces (sometimes mesoscutum less densely pubescent), except for bare metapostnotum. Metapostnotum very short, shorter than metanotum, not reaching posterior margin of dorsal surface of propodeum. S4 with median tassel or brush (except for *S. placidula*) ..... 23
- Body without or with sparse tomentum on most of surfaces; only metasoma provided with posterior and sometimes anterior (very wide in *S. mongolica* and *S. pjalmensis gaschunica*) bands of appressed plumose hairs. Metapostnotum usual, as long as or longer than metanotum, reaching posterior margin of dorsal surface of propodeum. S4 without special pubescence ..... 28
- 23 (22). Smaller, body length 4 mm. S4 without special pubescence (Fig. 53). Gonostylar set complete. Main body of upper gonostylus rectangular rounded in plane, on inner surface with plate bearing fan of

- several thick bristles; medial lobe of upper gonostylus thin, short, curved (Fig. 63). Lower gonostylus shorter than upper one, moderately wide at base, evenly narrowed toward apex, pointed at distal end (Fig. 64) ..... 14. *S. (Placidohalictus) placidula* (Blüthgen)
- Larger: body length not less than 5 mm. S4 with median tassel or brush ..... 24
- 24 (23). S4 on posterior part provided with narrow flattened median tassel of long thick, closely bordering to each other bristles directed backward (Figs. 58, 59). Medial lobe of upper gonostylus moderately broad and long, on inner side bearing long thick dense bristles directed mesad (Figs. 69, 70). Lower gonostylus lost ..... 25
- S4 on posterior part provided with brush of short and very dense hairs directed downward. Medial lobe of upper gonostylus moderately varying in size, with other kind of pubescence. Lower gonostylus long and broad, somewhat shorter than upper one ..... 27
- 25 (24). Head rounded triangular in front view, approximately as high as wide or 1.05 times higher than wide (Fig. 28); about as wide as mesosoma. Clypeus entirely projecting below eyes, always with wide yellow stripe along lower margin. S5 nearly bare, without brush of dense hairs (Fig. 60). Body metallic green, except for usually brown clypeus and supraclypeal area. Mesoscutum and scutellum covered with relatively sparse pubescence, not concealing underlying surface. Body length 5-6 mm ..... 24. *S. (Vestitohalictus) pulverea* (Morawitz)
- Head transversely elliptical in front view, short (1.1-1.15 times as wide as high; Fig. 27) and broad (1.1-1.2 times as wide as mesosoma). Clypeus projecting below eyes by 2/3-1/2 of its height, usually dark entirely, sometimes always with narrow yellow or dark yellow stripe along lower margin. S5 at posterior margin with rounded triangular (in plane) brush of short, very dense, erect hairs (Figs. 58, 59) ..... 26
- 26 (25). Larger, body length 6.5-7.0 mm. Head and mesosoma covered with dense pale tomentum concealing underlying surfaces. Fore and middle femora rusty yellow; hind femur light brown; tibiae goldish yellow, middle and hind tibiae with rusty brown spot. Metasomal terga brown, with slight green metallic tint ..... 22. *S. (Vestitohalictus) gobiensis* (Ebmer)
- Smaller, body length 5.3-6.3 mm. Head and mesosoma covered with less dense pale tomentum. Legs darker, frequently entirely brown. Metasomal terga metallic green or black, with green tint, except for horny-yellowish translucent posterior areas ..... 23. *S. (Vestitohalictus) pseudovestita* (Blüthgen)
- 27 (24). Larger, body length 7.5-8.5 mm. Body metallic green or steel-green. Ultimate flagellomere truncate (Fig. 46). S4 on posterior part with small longitudinally elliptical brush of short, very dense, erect (directed downward) hairs; S5 with inconspicuous pubescence (Figs. 56, 57). Medial lobe of upper gonostylus broad and very long, abundantly pubescent (Fig. 67). Lower gonostylus moderately broad, slightly club-shaped (Fig. 68) ..... 2a. *S. (Mucoreohalictus) pollinosa cariniventris* (Morawitz)
- Smaller, body length 6.0-6.5 mm. Body black, without metallic tint. Ultimate flagellomere usual, rounded at apex (Fig. 45). S4 with long transverse brush of short, very dense, erect (directed downward) hairs along posterior margin; S5 with  $\Lambda$ -shaped (in plane) pubescence formed by long inclined hairs directed postero-laterad (Figs. 54, 55). Medial lobe of upper gonostylus very short, very thin, curved, with few short hairs (Fig. 65). Lower gonostylus very broad, pointed at apex, with large, acute-triangular subbasal prominence on dorsal margin (Fig. 66) ..... 1. *S. (Mucoreohalictus) indefinita* (Blüthgen)
- 28 (21). S6 flat. Antenna short (Figs. 37-40), usually only a little longer than that in female (except for *S. aeraria*, Fig. 36, and *S. semitecta*, Fig. 41) ..... 29
- S6 with deep median pit in anterior part. Antenna long, reaching metasoma (Figs. 42-44) ..... 34
- 29 (28). T1 on slanting and dorsal surfaces nearly to its posterior hair band and T2-T4 on anterior halves covered with dense whitish or yellowish tomentum. Clypeus dark brown, without metallic tint. Legs light brownish orange, with expansive yellow pattern. Head rounded triangular in front view, with strongly projecting clypeus, about as high as wide. Medial lobe of upper gonostylus narrow and long, reaching distal end of gonostylus (Figs. 75, 79) ..... 30
- Metasomal terga only with posterior and sometimes narrow anterior hair bands (except for T4 in *S. semitecta*, that covered with tomentum). Clypeus usually metallic green or black, with green tint. Legs usually black, with yellow ..... 31
- 30 (29). Smaller: body length 4.5 mm. Head somewhat higher than wide (Fig. 38). Antenna relatively long, nearly reaching posterior end of mesosoma; middle flagellomeres nearly cylindrical, 1.5 times as long as their diameters (Fig. 38). T1-T3 on discs partly brown, without or with slight metallic tint. Mesoscutum relatively sparsely punctate, with distinct shiny interspaces. Lower gonostylus very broad, straight, shorter than upper gonostylus (Fig. 76) ..... 17. *S. (Seladonia) mongolica* (Morawitz)

- Larger: body length 6.0-6.5 mm. Head somewhat wider than high (Fig. 33). Antenna shorter; middle flagellomeres stronger convex in lower side, 1.3 times as long as their diameters (Fig. 40). Metasomal terga light green metallic, except for horny yellow translucent posterior areas. Mesoscutum more densely punctate, slightly shiny. Lower gonostylus thin, long, as long as upper gonostylus (Fig. 79) ..... 20a. *S. (Seladonia) pjalmensis gaschunica* (Blüthgen) 31 (29). Antenna long (Figs. 36, 41), reaching metasoma. Sculpture of dorsal surface of propodeum varying ..... 32
- Antenna short (Figs. 37, 39), at most reaching propodeum. Dorsal surface of propodeum with wide shiny stripe along posterior margin ..... 33
- 32 (31). Larger, body length 6.5-7.0 mm. Body brightly metallic bronze-green. Head high and, as a rule, thick, elongate elliptical (usually almost rectangular, owing to broad clypeus) in front view, 1.15-1.2 times as high as wide (Fig. 29); vertex strongly developed, its length (thickness) 1.5-2.0 times distance between inner margins of lateral ocelli; genal area 1.5-2.0 times as wide as eye in lateral view to head. Dorsal surface of propodeum mat, without shiny stripe along posterior margin. Metapostnotum triangular, nearly as long as scutellum. Posterior hair bands of metasomal terga slightly developed, anterior bands lacking. Medial lobe of upper gonostylus thin, short, strongly curved (Fig. 71). Lower gonostylus thin, triangularly broadened at apex, as long as upper gonostylus (Fig. 72) ..... 15. *S. (Seladonia) aeraria* (Smith)
- Smaller, body length 5.0-5.5 mm. Body usually metallic green, with steel tint. Head thin, egg-shaped in front view, with narrow, strongly projecting clypeus, 1.1 times as high as wide (Fig. 34); vertex and genal area much less developed. Dorsal surface of propodeum with wide shiny stripe along posterior margin. Metapostnotum widely rounded, about as long as metanotum. Metasomal terga provided with well developed posterior hair bands; T3-T5 on discs usually covered with not dense tomentum. Medial lobe of upper gonostylus thin, longer, straight, with several bristles at apex (Fig. 81). Lower gonostylus thin, as long as only somewhat shorter than upper gonostylus, pointed at apex (Fig. 82) ..... 21. *S. (Seladonia) semitecta* (Morawitz, 1874) 33 (31). Head as high as wide or somewhat shorter than wide, roundish in front view. Clypeus projecting below eyes only by 1/2-2/3 its height (Fig. 30). Head and mesosoma with white pubescence. Metpostnotum semi-lunar, about as long as metanotum. Metasomal terga with dense and continuous posterior hair bands. T2 and T3 also with anterior hair bands. Medial lobe of upper gonostylus thin, long, straight, with flat club at apex provided with several long bristles (Fig. 73). Lower gonostylus broad, narrowed toward apex (Fig. 78). Body length 5-6 mm ..... 16. *S. (Seladonia) lucidipennis* (Smith)
- Head 1.15 times as high as wide, elliptical triangular in front view. Clypeus projecting below eyes only by entire its height (Fig. 32). Vertex and dorsal surface of mesosoma covered with brown pubescence. Metpostnotum triangular, nearly as long as scutellum (Fig. 47). Metasomal terga with sparse posterior hair bands widely interrupted medially. T2 and T3 also without anterior hair bands. Medial lobe of upper gonostylus nearly as long as main body of gonostylus, relatively narrow, slightly widened in distal half, narrowly rounded at apex, slightly curved, provided with several long bristles in both sides of distal half (Fig. 77). Lower gonostylus somewhat shorter than upper gonostylus, relatively narrow, arc-wise in lateral view (Fig. 78). Body length 6.5 mm. (Female unknown) ..... 19. *S. (Seladonia) nikolskayae* sp. n. 34 (28). Body black, with deep blue metallic tint on head and mesosoma. Malar space wide, only 2.0-2.5 times mandible width at base. T1-T5 with badly developed hair bands on posterior areas; on discs covered with relatively long and dense erect whitish hairs, especially long on T1. T1 sparsely and obscurely punctate. Medial lobe of upper gonostylus relatively long (Fig. 91). Lower gonostylus short and broad, not curved (Fig. 92). Body length 6.5-7.0 mm ..... 17. *S. (Pachycele) mondaensis* (Blüthgen)
- At least, head and mesosoma metallic green or blue (except for *S. confusa*, in which they black, with bronze or green tint). Malar space nearly linear, 4-6 times mandible width at base. T1-T5 with well developed hair bands on posterior areas; on discs with inconspicuous pubescence. T1 with distinct and relatively dense punctation ..... 35
- 35 (34). S2 and S3 provided with posterior bands of dense appressed hairs, triangularly broadened medially. Vertex strongly flattened, nearly sharp along posterior (upper) margin. Medial lobe of upper gonostylus much longer than its main body, strongly broadened at apex ..... 36
- S2 and S3 poorly pubescent, provided without posterior bands. Vertex not flattened, narrowly or widely rounded along posterior margin. Medial lobe of upper gonostylus shorter, very narrow, parallel-sided ..... 39
- 36 (35). Head and mesosoma usually metallic yellowish



- green. Legs usually almost entirely yellow, with light brown pattern, except for dark brown trochanters, coxae and sometimes hind femur. Medial lobe of upper gonostylus forming triangular club in distal third (Fig. 89). Lower gonostylus relatively narrow, 4-5 times as long as wide (Fig. 90). Body length 7-8 mm
- 8a. *S. (Pachyceble) leucahenea leucahenea* (Ebmer)
- Head and mesosoma metallic darg green or deep blue. Legs darker, also fore femur partly, middle and hind femora almost entirely dark brown, trochanters, all tibiae with large brown or black longitudinal spot on outer surfaces. Medial lobe of upper gonostylus forming elliptical club in distal third (Figs. 85, 87, 93). Lower gonostylus broad, with maximal width at apex, 1.5-2.5 times as long as wide ..... 37
  - 37 (36). 3rd flagellomere twice as long as its diameter (Fig. 42). Metapostnotum triangular, about as long as scutellum (Fig. 48), delimited from punctate upper parts of lateral surfaces of propodeum only by weak carina, without smooth stripe along its posterior margin. Lower gonostylus 3 times as wide as long (Fig. 88). Head 1.1 times as high as wide (Fig. 35). Metasoma black, with strong bronze tint. Body length 6 mm. (Female unknown) ..... 7. *S. (Pachyceble) leleji* sp. n.
  - 3rd flagellomere 1.6 times as long as its diameter. Metapostnotum semi-lunar, about as long as metanotum, with shiny stripe along its posterior margin. Lower gonostylus 1.5-2.0 times as wide as long (Figs. 86, 94) ..... 38
  - 38 (37). Head almost roudish in front view, with slightly projecting clypeus, 1.05 times as high as wide. Metasoma reddish brown, with bronze tint. Body length 7 mm. (Female not included in the key) ..... 10. *S. (Pachyceble) opacoviridis* (Ebmer)
  - Head almost rounded triangular in front view, owing to strongly projecting clypeus, 1.1 times as high as wide. Metasoma metallic blue-green reddish brown, with bronze tint. Body length 7 mm ..... 5. *S. (Pachyceble) dorni* (Ebmer)
  - 39 (35). Upper gonostylus distinctly emarginate distally (Fig. 95). Lower gonostylus nearly straight (Figs. 95, 96). Flagellum on lower side yellow to ochre-brown. Head and mesosoma metallic green or blue. Metasoma usually shiny, with distinct metallic tint. Body length 6-7 mm ..... 13a. *S. (Pachyceble) tumulorum ferripennis* (Cockerell)
  - Upper gonostylus straight along distal margin (Fig. 83). Lower gonostylus curved at almost right angle (Fig. 83) ..... 40
  - 40 (39). Flagellum entirely black or fuscous. Head and mesosoma black, with bronze tint, sometimes weak. Metasoma mat, black, usually without metallic tint. Body length 6-7 mm ..... 4a. *S. (Pachyceble) confusa pelagia* (Ebmer)
  - Flagellum on lower side yellow to ochre-brown. Head and mesosoma metallic green or blue. Metasoma usually shiny, with distinct metallic tint ..... 41
  - 41 (40). Mesoscutum more coarsely and sparsely punctate (on disc, 20-30  $\mu$ m / 0.2-0.8), polished in interspaces. Hind tarsus shorter (Fig. 51). Median pit of S6 delimited at anterior margin by high transverse fur-like brush of very dense erect hairs. Body length 6-7 mm ..... 6. *S. (Pachyceble) gavarnica* (Pérez)
  - Mesoscutum twice less coarsely and sparsely punctate, shagreened in interspaces. Hind tarsus longer (Fig. 52). Median pit of S6 delimited at anterior margin by very weak fur-like brush. Body length 6.5 mm ..... 12. *S. (Pachyceble) transbaikalensis* (Blüthgen)

## An annotated list of the Eastern Palearctic species

### 1. *Seladonia (Mucoreohalictus) indefinita* (Blüthgen, 1923)

*Halictus indefinitus* Blüthgen, 1923a: 313, Fig. 13.  
Holotype: , TURKMENISTAN: Takhta-bazar; NMW; examined.

*Taxonomy.* Ebmer, 1975: 172, 176 (key); 1976a: 232 ( ), Figs. 31-34; 1985b: 273, 274, Figs. 1, 3, 5.

*Material examined.* MONGOLIA (first record): Hovd, Utyn-mod, 50 km SSW Uench, 27.VI.1980, leg. M.A. Kozlov, 2 ; ZISP.

*Distribution.* West of North Africa (Morocco and Tunisia; isolated populations), Asia Minor, southern Kazakhstan, Turkmenistan, Tajikistan, western Mongolia (Hovd). The records of the species from Asia Minor and Iran by Warncke (1982: 144; 1984: 310) belong to *S. nigricutis* (see Ebmer, 1985b: 273).

### 2. *Seladonia (Mucoreohalictus) pollinosa* (Sichel, 1860)

*Distribution.* A western Palearctic species, widely distributed in steppes and deserts, as far in the east as northwestern China and western Mongolia. It is considered to be consisting of four subspecies: *S. pollinosa thevestensis* (Pérez, 1903), inhabiting the west of North Africa (from Morocco to Tunisia); *S. pollinosa pollinosa*, Corsica, Sicily and Sardinia; *S. pollinosa thesea*

(Ebmer, 1975), Crete; and *S. pollinosa cariniventris* (Morawitz, 1876), occupying the most part of the specific distributional range in Eurasia (see below).

**2a. *Seladonia (Mucoreohalictus)*  
*pollinosa cariniventris* (Morawitz, 1876)**

*Halictus cariniventris* Morawitz, 1876: 220 (key), 226. . Lectotype: , KYRGYZSTAN: Osh; designated by Blüthgen (1955: 19); ZMMU; examined. The lectotype designation by Warncke (1982: 138) is unnecessary.

*Halictus carinaeventris* Fahringer et Friese, 1921: 163. Unjustified emendation of *H. cariniventris* Morawitz, 1876.

*Halictus cariniventris* var. *creticola* Strand, 1921: 314. . Holotype: , GREECE: Crete; DEI; examined. Synonymy by Ebmer (1988b: 578).

*Halictus cariniventris flavotectus* Cockerell, 1922: 550. . Holotype: , PAKISTAN: Quetta; USMW. Synonymy (= *H. pollinosus*) by Blüthgen (1926a: 406).

*Halictus pollinosus* ssp. *limissicus* Blüthgen, 1938: 43. . Holotype: , CYPRUS: Limassol; MNB; examined. Synonymy by Ebmer (1988b: 578).

**Taxonomy.** Blüthgen, 1920: 104 (key), 131 (key); 1921: 286; 1922: 56; 1924: 352, 471 (key), 534 (key); 1926a: 406; 1935b: 361; 1955: 19 (*H. pollinosus*); Ebmer, 1969: 156 (key), 174; 1975: 169, *H. pollinosus*; 1988b: 578 (subspecific status); Warncke, 1975: 107; 1982: 138; Fan, 1991: 479 (key), 480 (key, *H. pollinosus*).

**Published records.** Ebmer (1982: 207; “*H. pollinosus*”): MONGOLIA: Hovd: Bulgan-gol.

**Material examined** (5 ). MONGOLIA: Hovd: Utynmod, 50 km SSW Uench; Bayan-Hongor: Echin-gol, 50 km NNE Tsagan-bogd Mt.; Ömnögovi: Gundaychin-huduk, 20 km WSW Une-huduk; Dornod: “Bayan-Barite, Halh”. CHINA: Neimenggu (**first record**): “Dyn-yuan-in, northern Alashan, 23.VIII.1906, leg. P.K.Kozlov”, 1 ; ZISP.

**Distribution.** Steppes and deserts of Eurasia to Mongolia in the east. Southern Europe from Portugal and Spain in the west, through southern France, Italy, Hungary, Bulgaria and Greece, as far in the east as southeastern European Russia in the east, to Austria in the north. Asia: Israel, Asia Minor, Tajikistan, Uzbekistan, Kyrgyzstan, Iran, Afghanistan, Pakistan, Mongolia (Hovd, Bayan-Hongor, Ömnögovi, Dornod), northern China (Xinjiang, Neimenggu).

**3. *Seladonia (Pachyceble) argilos*  
(Ebmer, 2005)**

*Halictus (Seladonia) argilos* Ebmer, 2005: 367, Abb. 15-17. . Holotype: , CHINA: Wuhai (Neimenggu); OLML.

**Published records.** Ebmer (2005: 367): CHINA: Neimenggu: Wuhai.

**Material examined.** MONGOLIA (**first record**): Ömnögovi, Undyn-gol, 25 km S Han-bogd, 7.VIII.1971, leg. I.M. Kerzhner, 1 ; ZISP.

**Distribution.** Southern Mongolia (Ömnögovi), northern China (Neimenggu).

**Variability.** The female from Mongolia (see “Material examined”) slightly differs from the types (5 ) from China in the following characters: (1) head somewhat higher, height / width ratio 1.03 vs. 0.99 in types; (2) supraclypeal area (antefrons) dark brown, without metallic tint vs. black, with reddish and green tints in types; (3) mesoscutum more densely and uniformly punctate (0.3-0.6) vs. 0.5-2.5 in types.

**4. *Seladonia (Pachyceble) confusa*  
(Smith, 1853)**

**Distribution.** A common Holarctic species, widely distributed in moderate and warm zones. It is considered to be consisting of six subspecies: Eastern Nearctic *S. confusa confusa* (= *Halictus constrictus* Provancher, 1882; *H. provancheri* Dalla Torre, 1896; *H. nearcticus* Vachal, 1904); Western Nearctic *S. confusa arapahonum* (Cockerell, 1906) (= *H. olivarius* Sandhouse, 1924); *S. confusus glacialis* (Ebmer 1979), inhabiting mountains of Central Spain; Alpine *S. confusa alpina* (Alfken, 1907); *S. confusa perkinsi* (Blüthgen, 1926) (= *H. flavipes* auct., nec *Apis flavipes* Fabricius, 1787), widely distributed in Eurasia from Spain to eastern Kazakhstan (**first record**); and Eastern Palaearctic *S. confusa pelagia* (Ebmer 1996) (see below). For differences between ssp. *pelagia* and ssp. *perkinsi* see Pesenko & Davydova (2004: 687).

**4a. *Seladonia (Pachyceble) confusa pelagia*  
(Ebmer 1996)**

*Halictus (Seladonia) confusus pelagius* Ebmer 1996: 269, Figs. 6-9. . Holotype: , RUSSIA: Ryazanovka (Primorskii Territory); EBM.

**Taxonomy.** Dawut & Tadauchi, 2003: 126; Pesenko & Davydova, 2004: 685.

*Published records.* Ebmer (1996: 269): RUSSIA: Primorskii Territory: Anisimovka; 28 km SW Chuguevka; Khasan; Ryazanovka; Shkotovo. Proshchalykin (2003: 6): RUSSIA: Kunashir: Alekhino. Pesenko & Davydova (2004: 686): RUSSIA: Eastern Siberia, Far East; MONGOLIA (see "Material examined"). Proshchalykin (2004: 7): RUSSIA: Amur Province, Khabarovsk and Primorskii Territories, Kunashir (no locality). Ebmer (2005: 362): MONGOLIA: Töv: 100 km E Ulanbator; Arhangay: 100 km NE Tsetserleg; CHINA: Shaanxi: 40 km S Baoji, 100 km W Beijing, Qilatu Shan. Proshchalykin & Kupianskaya (2005: 10): RUSSIA: Magadan Province.

*Material examined* (121, 242). RUSSIA: Krasnoyarsk Territory (**first record**): Krasnoyarsk; Khakassia: 150 km SW Minusinsk; Buryatia: Boyarsk on south bank of Lake Baikal; Yakutia: Tomporuk River in foothills of Verkhoyanskii Ridge, Neryungri, upper reaches of Algama River near mouth of Artyk River, 35 km higher mouth of Tuksan River (Tokinskii Stanovik Ridge), Jewish Autonomous Republic: 40 km NNW Amurzet; Amur Province: Khingan Nature Reserve, Klimoutsy, Kundur, Novospasskii, 25 km SW Simanovsk; Magadan Province (12 km N Seimgan); Khabarovsk Territory: Dormidonovka (92 km S Khabarovsk), Khabarovsk, Komsomolsk-on-Amur, Pivan, Slavyanka; Primorskii Territory: Anisimovka, 10 km NW Artem, 20 km S Barabash-Levada, Golubinyi Utes [Pigeon cliff] on Lake Khasan, Gornotayezhnoe, Kedrovaya Pad, 20 km SW Krounovka, 5 localities in Lazovskii Nature Reserve, Murav'yevka, Novitskoe, 15 km S Partizansk, 15 km NW Partizansk, Novokachalinsk, 20 km N Plastun, 15 km SE Pos'et, 15 km SW Slavyanka, 4 localities in environs of Spassk, 30 km SE Ussuriisk, Vladivostok; Sakhalin: 15 km NE Yuzhno-Sakhalinsk; Kunashir: Alekhino. MONGOLIA: Töv: Kerulen, Songino; Hentiy: Old Bayan-adrag, 10 km NNW Old Binder; Dornod: Syelji River in Major Hingan Mts., Tsagan-nur on Lake Horin, 30 km NNE Havirga.

*Distribution.* Russia: Altai, Khakassia, Krasnoyarsk Territory, Buryatia, Yakutia, Jewish Autonomous Republic, Amur and Magadan Provinces, Khabarovsk and Primorskii Territories, Sakhalin and Kunashir; Mongolia (Töv, Arhangay, Hentiy, and Dornod); northeastern China (Shaanxi).

##### 5. *Seladonia (Pachyceble) dorni* (Ebmer, 1982)

*Halictus (Seladonia) dorni* Ebmer, 1982: 204, Fig. 7, Photo 1 on Pl. I. Holotype: , MONGOLIA: Ich-Bogd (Bayan-Hongor); in Univ. Halle.

*Taxonomy.* Dawut & Tadauchi, 2002: 143, Pls. 39, 40; Ebmer, 2005: 363, Abb. 1-6 ( ). The male of "*S. dorni*" described by Fan (1991: 479, 480, Figs. 2-5) rather belongs to *S. argilos* (see Ebmer, 2005: 364).

*Published records.* Ebmer (1982: 204; 1988a: 362; 2005: 363): MONGOLIA: Bayan-Hongor: Ich-bogd, 75 km S Bayanhongor, 150 km S Bayanhongor; Hovd: Conocharajch-gol, Bulgan-gol, Jarantaj; Uvs: Charchiraa, 30 km S Ulaangom. Dawut & Tadauchi (2002: 144): MONGOLIA: Bayan-Hongor: Ich-bogd.

*Distribution.* Mongolia (Bayan-Hongor, Hovd, and Uvs).

##### 6. *Seladonia (Pachyceble) gavarnica* (Pérez, 1903)

*Halictus gavarnicus* Pérez, 1903: 43 (p. ccx, in Journal). Lectotype: , FRANCE: Gedré (northern Pyrenées); designated by Ebmer (1972b: 616); MNP.

*Halictus tataricus* Blüthgen, 1933a: 76. Syntypes: 2, 2, AZERBAIJAN: Kussary; MNB and ZISP; examined. The current status of the taxon is a subspecies of *H. gavarnicus*.

*Halictus gavarnicus* var. *delphinalis* Blüthgen, 1935a: 111. Holotype: , FRANCE: Grenoble (Western Alps); MNB; examined. Synonymy (= *H. gavarnicus gavarnicus*) by Ebmer (1979: 122).

*Halictus (Seladonia) gavarnicus longigenae* Warncke, 1988: 91, 93, Map. 9. Holotype: , GREECE: Tymfi (Pindos); OLML. Synonymy (= *H. gavarnicus gavarnicus*) by Ebmer (1988b: 572).

*Taxonomy.* Blüthgen, 1933a: 77, Figs. 2, 3; Ebmer, 1969: 154 (key), 155 (key), 173, Figs. 24, 27; 1972b: 616; 1979: 125, 126, 129, Figs. 7-10; 1982: Figs. 3, 4, 6; 1988a: 331 (key), 332 (key), 338 (key), 367, 370, Fig. 73, 87; 1988b: 572; Warncke, 1975: 106; Pesenko *et al.*, 2000: 171 (key), 183, Fig. 257; 2002: 42 (key), 43 (key), Fig. 102.

*Published records.* Ebmer (1996: 271): RUSSIA: Primorskii Territory: Litovka Mt.; MONGOLIA: Bayan-Hongor: Hangai Mts., Ulan-Zotgalan.

*Distribution.* A transpalaeartic species considered to be consisting of three subspecies. The nominotypical subspecies (= *Halictus gavarnicus* var. *delphinalis* Blüthgen; *H. gavarnicus longigenae* Warncke) inhabits montane steppes of the Eastern Pyrenées, Western Alps and southern Greece. *S. gavarnica tatarica* (Blüthgen) widely spreads in southern and Middle Europe from southern Germany in the west to Bashkiria in the east, as far in the north as Austria and southern Poland; also is

recorded from Asia Minor and Azerbaijan. The unnamed eastern subspecies, found in Mongolia and the Russian Far East, was not described till now, as a shortage of the material does not permit to make adequate diagnosis (see Ebmer, 1996: 271).

#### 7. *Seladonia (Pachyceble) leleji* Pesenko, sp. n.

*Holotype*: ♂, RUSSIA, Primorskii Territory, Novokachalinsk, 26.VII.1995, leg. A.S. Lelej [label in Russian]; ZISP.

*Diagnosis*. The new species belongs to the *S. leucahenea* group, members of which differ from other species of the subgenus in the following characters: vertex very narrowed (nearly sharp) along its posterior margin in both sexes; S2 and S3 of males with dense white hair posterior bands triangularly broadened medially; medial lobe of upper gonostylus of males very long and strongly broadened distally. It is similar to *S. leucahenea* (Ebmer) in the long triangular metapostnotum, but in the structure the gonostyli, it is close to *S. dorni* (Ebmer) and *S. opacoviridis* (Ebmer).

**Male. Structure.** Body length 6.0 mm. Head nearly 1.1 times as high as wide (Fig. 35), egg-shaped in front view. Clypeus 1.4 times as wide (estimated as distance between anterior tentorial pits) as high; 3/4 of its height placed below eyes. Genal area / eye width ratio 0.9 in lateral view to head. Malar space 0.3 times as wide as mandible at base. Antenna long, reaching metasoma. 2nd-5th flagellomeres twice as long as their diameters (Fig. 42). Mesoscutum straight at anterior margin. Metapostnotum triangular, about as long as scutellum (Fig. 48), separated from punctate upper parts of lateral surfaces of propodeum by slight carina, no smooth stripe. Hind tarsus slender (Fig. 50). Metasoma elongate elliptical-cylindrical. Posterior areas of terga narrow, slightly depressed along all their width. Discs of terga moderately convex. Medial lobe of upper gonostylus curved in proximal part and directed postero-mesad; in distal 3/4 strongly broadened, widely rounded at apex; in the whole it a triangularly rounded leaf-shaped plate with short petiolus (Fig. 87). In normal (natural) position, medial lobes of both upper gonostyli crossing and adjoining with each other along their inner margins. Lower gonostylus 2.5 times as long as wide, provided many long hairs on inner surface (Fig. 88).

*Sculpture*. Clypeus uniformly punctate (25-30  $\mu\text{m}$  / 0.3-0.6), polished on interspaces. Frons and paracocular areas very densely punctate, mat. Genal areas obscurely and sparsely punctate, shiny. Punctuation of vertex intermediate between those on frons and genal areas. Meso-

scutum uniformly densely punctate (15-20  $\mu\text{m}$  / 0.2-0.3), slightly shiny. Mesopleura mat, roughened, with unclear kind of sculpture. Metapostnotum rather granulate, mat, with sparser and weak reticulation in anterior half; weak carina along in its posterior margin narrowly shiny. Lateral and posterior vertical surfaces of propodeum in upper half distinctly punctate, similarly to mesoscutum. Metasomal terga nearly uniformly densely, very finely punctate (10  $\mu\text{m}$  / 0.2-0.3), mat.

*Coloration*. Head and mesosoma dark metallic blue-green. Clypeus on lower third, labrum and most of mandibles dark yellow. Scape and pedicel of antenna entirely black; flagellum ochre-brown on lower side, dark brown on upper side. Tegula brownish infusate, with dark yellow spot in anterior third. Coxae and trochanters black; most of femora and large spots on middle and hind tibiae brown; rest of legs yellow. Metasoma black, with strong metallic bronze tint.

*Pubescence*. Head and mesosoma with whitish, not dense, erect hairs, more long and dense on lower half of face, genal areas, sides of mesosoma, and metanotum. T1 with large lateral spots of appressed white hairs; T1-T5 with narrow posterior bands, T2 and T3 also with anterior bands of appressed white hairs.

**Female unknown.**

*Etymology*. This species is named for Arkadi S. Lelej (IBSV), a collector of the holotype, a scholar of authority in Aculeata.

#### 8. *Seladonia (Pachyceble) leucahenea* (Ebmer, 1972)

*Distribution*. A transpalearctic species considered to be consisting of three subspecies: *S. leucahenea arenosa* (Ebmer, 1976), widespread in moderate zones of Europe; *S. leucahenea occipitalis* (Ebmer, 1972), inhabiting Transcaucasus and northeastern Turkey; and Eastern Palearctic nominotypical subspecies (see below). For differences between ssp. *leucahenea* and ssp. *arenosa* see Pesenko & Davydova (2004: 688).

#### 8a. *Seladonia (Pachyceble) leucahenea leucahenea* (Ebmer, 1972)

*Halictus (Seladonia) leucaheneus* Ebmer, 1972a: 225.

. *Holotype*: ♂, KAZAKHSTAN: environs of Lake Balkhash; MNB; examined.

*Taxonomy*. Ebmer, 1978a: 189 (subspecific status; ); 1985a: 201; 1988b: 568; Fan, 1991: 479 (key); Dawut & Tadauchi, 2000: 70, Pls. 4, 5; Pesenko & Davydova, 2004: 686, Table 2.



*Published records.* Blüthgen (1934a: 4; *H. fasciatus*): RUSSIA: Yakutia: Yakutsk; CHINA: Gansu: vicinity of Minsiang. Ebmer (1978a: 189): CHINA: Heilongjiang: Harbin. Ebmer (1982: 204): MONGOLIA: Hovd: Bulgan-gol, Jarantaj; Uvs: Charchiraa; 30 km S Ulaangom; Bayan-Hongor: Ich-bogd. Ebmer (1985a: 201): RUSSIA: Yakutia: Yakutsk; CHINA: Heilongjiang: Harbin. Ebmer (1988a: 359): CHINA: Heilongjiang: Harbin. Fan (1991: 479): CHINA: Heilongjiang. Dawut & Tadauchi (2000: 73): MONGOLIA: Bayan-Hongor: Ich-bogd. Pesenko & Davydova (2004: 687): RUSSIA: Irkutsk Province, Yakutia, Buryatia, Chita and Amur Provinces, Khabarovsk and Primorskii Territories; MONGOLIA (see “Material examined”). Proshchalykin (2004: 7): RUSSIA: Amur Province, Khabarovsk and Primorskii Territories (no locality). Ebmer (2005: 363): MONGOLIA: Hovd: Conocharajch-gol; Bulgan; Uvs: Ulangom, Tarialan; Töv: Batsumber, Ulanbator, 90 km N Ulanbator, 100 km E Ulanbator; Bayan-Hongor: 86 km S Bayanhongor, 2 km S Bayanhongor; Arhangay: 25 NE Tsetserleg.

*Material Examined* (328 , 281 ). RUSSIA: Irkutsk Province: Dar’ino Village between Kirensk and Vitim; Yakutia: 60 km N Amga, mouth of Labya River, Nyurba on Vilyui River, Olekminsk, mouth of Olekma River, 75 km SSE Novopokrovskoe on Amga River, 60 km E Vilyuisk, 90 km N Yakutsk, 5 localities in environs of Yakutsk, Buryatia: Saragol on Chikoi River; Chita Province: Urulyungui Station; Amur Province: right bank of Amur River against Beitonovo, Blagoveshchensk, Dim, 20 km W Poyarkovo, 75 km W Svobodnoe; Khabarovsk Territory: Amurastalevskaya Mt., Khabarovsk, Khirpi; Primorskii Territory: Golubinyi Utes [Pigeon cliff] on Lake Khasan, 7 km N Khasan, Novokachalinsk. MONGOLIA: Hovd: Bodonchin-gol (12 km SW Altai), Narin-bulak, Ich-Havtgiin-Nuru Ridge; Uvs: 45 km ESE Ulangom; Dzavhan: Songino; Arhangay: 40 km of NW Tsererleg; Övör-Hangay: Arts-bogd (20 km S Hovd), Baga-bogd (20 km ESE from the highest top); Ömnö gobi: 30 km NNE Bulgan; Selenge: ro-gol near Dulanh, 25 km E Darhan, 13 km N Bayan-gol; Töv: Sugunur in upper reaches of Hara-gol, 145 km SW Ulan Bator, SSW Buyant, 12 km N Galshir; Dornodgovi: 45 km NW Dalan-jargalan Station, 60 km NW Choir; Dornod: Duchin-gol (10 km NE Gurvan-dzagal), Bayandun (13 km W Dasgbalbar). Horin-tsagan-nur (18 km NE Dashbalbar), 60 km SSW Choibaksan, 30 km NNE Havirga, Matad, 45 km NNE Ich-chulut-ula, 30 km W Tamsagbulak, Tamsagbulak, Modon-Obo (30 km ENE Tsagan-ula), Huh-nor, eastern angle of Buir-nur, Numreging-gol (32 km SE Salhit Mt.), 30 km ESE Dzavsar-bulak, Hal-

hin-gol (12 km SW Halhingol-Somon), Syelchzhi River in Major Hingan Mts.; Sühbaatar: 15 km SSE Hongor, 5 km NNE Barun-hunduk, 50 km EEW Barun-urt, 80 km NNE Barun-urt, Dzotol-han-ula. CHINA: Heilongjiang: “Manchuko: Barim”.

*Distribution.* Eastern Asia from Lake Balkhash to northeastern China: Eastern Kazakhstan, Kyrgyzstan, Altai, Irkutsk Province, Yakutia, Buryatia, Chita and Amur Provinces, Khabarovsk and Primorskii Territories, Mongolia, northern and northeastern China (Gansu, Heilongjiang).

#### 9. *Seladonia (Pachyceble) mondaensis* (Blüthgen, 1923)

*Halictus mondaensis* Blüthgen, 1923a: 285. . Holotype: , “Mongolei: Monda” [RUSSIA: Mondy (Buryatia); see Kerzhner, 1972: 66]; MNB; examined.

*Taxonomy.* Blüthgen, 1923b: 71 (key), 141; Ebmer, 1982: 205; 1988a: 373; Dawut & Tadauchi, 2003: 123, Pls. 61, 62; Pesenko & Davydova, 2004: 688, 689 ( ), Figs. 1-9.

*Published records.* Blüthgen (1923a: 285): RUSSIA: Buryatia (Mondy). Ebmer (1982: 205; 1988a: 373): MONGOLIA: Töv (Bogd-uul near Ulanbator). Pesenko & Davydova (2004: 691): RUSSIA: Tuva, Yakutia, Magadan Province (see “Material examined”). Proshchalykin & Kupianskaya (2005: 10): RUSSIA: Magadan Province.

*Material examined* (326 , 70 ). RUSSIA: Tuva: Lake Malyy Khindiktig-Khol (60 km W Mugur Aksa); Buryatia: Mondy (holotype); Yakutia: Bakhanai-Nashim, Zhigansk-Khoronko, Lena Rines near Zhigansk, Tomtor, Dungalakh frazil, left bank of Yana River against Verkhoyansk, Indigirka River in 15 km S Tebyulyakh, Balagannakh (30 km ESE Ust-Nera), 70 km ESE Ust-Nera, Notara River; Magadan Province: Lazo, 50 km N Seimchan, 12 km N Seimchan, upper reaches of Kolyma River (62°07' N), Sibit-Tyellakh, Susuman, Vetrennoe. MONGOLIA: Bulgan: Ingenii Pass, 33 km S Selenge.

*Distribution.* An inhabitant of the “Strongly Continental Sector” of Eastern Asia. Buryatia, Tuva, Yakutia, Magadan Province of Russia, central Mongolia.

#### 10. *Seladonia (Pachyceble) opacoviridis* (Ebmer, 2005)

*Halictus (Seladonia) opacoviridis* Ebmer, 2005: 365, Abb. 7-14. . Holotype: , CHINA: Ganguyi (Shaanxi); OLML.



*Published records.* Ebmer (2005: 364): CHINA: Shaanxi (Ganguyi; 35 km NE Yan'an; Suide; Qingjian), Shanxi (Jinglangling; Xiexian; Monan), Beijing (Haidian).

*Distribution.* Northern and northeastern China (Shaanxi, Shanxi, and Beijing).

**11. *Seladonia (Pachyceble) petraea***  
(Blüthgen, 1933)

*Halictus petraeus* Blüthgen, 1933a: 78, Fig 4. . Holotype: , TAJIKISTAN: Gursui-Tasch (Peter the First Ridge); ZISP; examined.

*Taxonomy.* Dawut & Tadauchi, 2003: 121, Pls. 59, 60.

*Material examined.* MONGOLIA (**first record**): Bayan-Ölgiy: "southeastern shore of Hoton-nur, 16-17.VII.1978, leg. M.A. Kozlov", 3 , ZISP; "Dzhargiliin-gol, 20 km NW Bulgan, 6.VII.1980, leg. I.M. Kerzhner", 1 , ZISP.

*Distribution.* Mountains of Tajikistan (Peter the First Ridge), Kyrgyzstan (Talas Alatau Ridge), and western Mongolia (Bayan-Ölgiy).

**12. *Seladonia (Pachyceble) transbaikalis***  
(Blüthgen, 1933)

*Halictus transbaikalis* Blüthgen, 1933a: 76. . Holotype: , RUSSIA: "Süd-Trans-baikalien" [no locality]; MNB; examined.

*Taxonomy.* Ebmer, 1982: 202 ( ), Figs. 1, 2; 1988a: 372; Dawut & Tadauchi, 2003: 118, Pls. 57, 58.

*Published records.* Blüthgen (1933a: 76): RUSSIA: "Süd-Transbaikalien" (no locality). Ebmer (1982: 203): CHINA: Neimenggu (no locality). Ebmer (1988a: 372): RUSSIA: Irkutsk Province (Irkutsk), MONGOLIA (no locality). Ebmer (2005: 362): MONGOLIA: Ömnögovy (40 km W Dalanzadgad), Bayan-Hongor (16 km NW Bayanhongor), Arhangay (25 km NE Tsetserleg).

*Material examined* (5 ). RUSSIA: Chita Province (**first record**): Bylyra on Kyra River. MONGOLIA. Töv: Sugu-nur in upper Hara-gol; Sühbaatar: 20 km W Shiliin-bogd-ula Ömnögovy; Udzur-dzag (40 km ESE Han-bogd; Dornod: 60 km NW Choir (Sumber).

*Distribution.* South of Eastern Siberia (Irkutsk, Chita Province), Mongolia, and northern China (Neimenggu).

**13. *Seladonia (Pachyceble) tumulorum***  
(Linnaeus, 1758)

*Distribution.* *S. tumulorum* (Linnaeus, 1758) is a

polyzonal panpalaeartic species considered to be consisting of four subspecies: Western Palaeartic *S. tumulorum tumulorum*; *S. tumulorum oros* (Ebmer, 1988), described from mountains of Greece; Corsican *S. tumulorum kyrnos* (Ebmer, 1988); and Eastern Palaeartic *S. tumulorum ferripennis* (see below). For differences between ssp. *ferripennis* (under the name *S. tumulorum higashi*) and ssp. *tumulorum* see Pesenko & Davydova (2004: 692).

**13a. *Seladonia (Pachyceble) tumulorum ferripennis***  
(Cockerell, 1929), **status n.**

*Halictus ferripennis* Cockerell, 1929: 586. . Syntypes: 2 , RUSSIA: "Smolenschina (near Irkutsk), Siberia" [Smolenskoe, 10 km SW Irkutsk]; BML.

*Halictus (Seladonia) tumulorum* ssp. *higashi* Sakagami et Ebmer, 1979: 543, Figs. 1-7. . Holotype: , JAPAN: Sapporo (Hokkaido); FAHUS. **Syn. n.**

*Taxonomy.* Ebmer, 1988a: 364; Fan, 1991: 479 (key); Kim, 1997: 2, Figs. 7-10; Pesenko & Davydova, 2004: 691, Tables 3, 4; Dawut & Tadauchi, 2002: 145, Pls. 41-43.

*Comment on the synonymy.* Ebmer (1978a: 189) informed that individuals of *S. tumulorum* (in the genus *Halictus* in the author's wider understanding) from Manchuria and northern Japan so strongly differ from the Western Palaeartic ones that can be considered a separate subspecies. This subspecies was described a year later by Sakagami & Ebmer (1979: 543) under the name *Halictus (Seladonia) tumulorum higashi*. These authors underlined a strong variability, even overlapping the differences between this subspecies and nominotypical one. Later Ebmer (1982: 204; 1988b: 570; 2005: 362) defined the distributional range of *S. tumulorum higashi* as including the south of the Russian Far East, northeastern China and northern Japan. According to Ebmer (1978a: 189), the types of *H. ferripennis* Cockerell from the environs of Irkutsk, belong to the nominotypical form of *S. tumulorum*.

For more accurate definition of the western borders of the distributional range of the eastern subspecies of *S. tumulorum*, Pesenko & Davydova (2004: 691, Tables 3, 4) have analysed the variability of *S. tumulorum* in the Eastern Palaeartic Region and the eastern part of the Western Palaeartic Region on the basis of the vast material deposited at ZISP, IBSS and ZMMU (a total of nearly a thousand individuals). We have distinguished four principal combinations of six characters: "typical of *S. tumulorum tumulorum*", "typical of *S. tumulorum*

*higashi*” and two intermediate combinations.

Our analysis has shown as follows. First, *S. tumulorum higashi* has so high intrapopulation variation, that some of individuals almost in each locality can be identified as belonging to *S. tumulorum tumulorum*. Second, percentages of the four outlined forms (character combinations) vary in different populations of the Eastern Palearctic Region, but this variability does not show a distinct geographical trend; in particular, the share of the “typical *S. tumulorum tumulorum*” individuals in each local population does not increase in the westward direction, and the share of the “typical *S. tumulorum higashi*” individuals, in the eastward one. Third, the “typical *S. tumulorum higashi*” individuals prevail or, at least, consist of a significant part in all of the studied populations in the Eastern Palearctic Region (the least percentage of them is recorded in central Yakutia, 30%), whereas the relative abundance of the “typical *S. tumulorum tumulorum*” form is low everywhere (the most percentage is recorded in Chita Province, one specimen from eleven examined, i.e. 9%). Fourth, although a very scanty material was available from some areas, on the whole it is possible make to a conclusion, that *S. tumulorum higashi* is spread from Japan in the east to Altai in the west and to Yakutia in the north; its western border (transgression zone) with the nominotypical subspecies passes through Eastern Kazakhstan.

Basing on the results above, it can be concluded that “*H. ferripennis*” recorded from the centre of the distributional range of the eastern subspecies of *S. tumulorum*, should be considered belonging to this subspecies, in spite of the similarity of “*H. ferripennis*” to the nominotypical form of *S. tumulorum*. For the establishment of subspecies, the geographical criterion prevails over morphological one. Hence, *H. tumulorum higashi* Sakagami et Ebmer, 1979 is ascertained here a junior synonym of *H. ferripennis* Cockerell, 1929.

*Published records.* Morawitz (1890: 366): CHINA: Gansu (Upin, *H. tumulorum*; “Chuan-Chua-Schan”, “*H. flavipes* F.”). Cockerell (1924: 581): RUSSIA: Primorskii Territory (Kudia River; Preobrazheniya Bay; “Kongaus” [= Anisimovka]). Cockerell (1929: 586; *H. ferripennis*): RUSSIA: Irkutsk Province (Smolenskoe, 10 km SW Irkutsk). Gussakovskij (1932: 63; “*H. daturae*”): RUSSIA: Primorskii Territory (Sedanka; Suchan). Blüthgen (1934a: 3): CHINA: Gansu (vicinity of Minsiang). Sakagami & Fukuda (1972: 4): JAPAN: Hokkaido (Nakagawa and Kamiotoineppu). Fukuda *et al.* (1973: 163): JAPAN: Hokkaido (Hama-Koshimizu). Sakagami & Fukuda (1973: 246): JAPAN: Hokkaido (Sapporo). Usui *et al.* (1976: 228): JAPAN: Hokkaido (Obihiro).

Ebmer (1978a: 189): RUSSIA: Primorskii Territory (Tigrovaya Pad), CHINA: Heilongjiang (Harbin; Erdaochajlinche). Ebmer (1978c: 309): NORTH KOREA (a number of localities in environs of Pyongyang). Sakagami & Ebmer (1979: 547): RUSSIA: Primorskii Territory (Tigrovaya Pad), Sakhalin (Korsakov; Yuzhnosakhalinsk); NORTH KOREA: Ryang-gang (Bochambo), Gang-von (Kum-gang san); CHINA: Heilongjiang (Harbin); JAPAN: Hokkaido (Hakodate; Sapporo), Honshu (Aomori). Ebmer (1982: 204): MONGOLIA: Uvs (Charchiraa; 30 km S Ulaangom). Ebmer (1988a: 364): RUSSIA: Sakhalin (no locality), NORTH KOREA (no locality), CHINA: Heilongjiang (Harbin), JAPAN: Hokkaido (no locality), Honshu (no locality). Yamada *et al.* (1990: 37): JAPAN: Honshu (Shimokita and Nambu). Ebmer (1996: 269): RUSSIA: Primorskii Territory (Arhipovka; Krounovka; Przewalsk; Ryazanovka; Sedanka; Shkotovo; Spuntik; Suchan; Tikhoe; Ussuriisk; 40 km E Ussuriisk; 30 km W Vladivostok). Kim (1997: 2): SOUTH KOREA (a lot of localities). Dawut & Tadauchi (2002: 150): JAPAN: Hokkaido (a lot of localities). Proshchalykin (2004: 7): RUSSIA: Amur Province, Khabarovsk and Primorskii Territories, Sakhalin, Kurils (no locality). Proshchalykin *et al.* (2004: 160): RUSSIA: Sakhalin (Yuzhnosakhalinsk). Ebmer (2005: 362): MONGOLIA: Töv (90 km N Ulanbator; Ulanbator; Zuunmod); SOUTH KOREA: Jirisan Mt. Proshchalykin & Kupianskaya (2005: 11): RUSSIA: Magadan Province.

*Material examined* (306 , 443 ). RUSSIA: Krasnoyarsk Territory: Krasnoyarsk; Irkutsk Province: Irkutsk, Rassokha; Buryatia (**first record**): Baikalsk; Yakutia: mouth of Pilke River, Olekmonsk, mouth of Olekma River, Khomurgan-Arbyn summer stand near mouth of Aldan River, 5 localities in environs of Yakutsk; Yakutsk, 75 km S Yakutsk; Lake Khariyalakh near Edei Village (200 km S Yakutsk), Oi-Bes near Pavlovskoe, Amga, Berdzhiges summer stand on left bank of Amga River, Khattygy-Terde on Amga River, 25 km N Aldan; Chita Province: Andrianovka Station, Kalga, Nerchinskii Work, Bylyra in flood plane of Kyra River; Amur Province: 75 km W Svobodnyi, 45 km W Svobodnyi, interfluvium of Malaya Pera and Bolshoi Ergel Rivers, Khingan Nature Reserve; Jewish Autonomous Republic: 40 km NNW Amurzet; Magadan Province: 12 km N Seimgan; Khabarovsk Territory: Komsomolsk-on-Amur, Pivan, Khabarovsk, Dormindontovka, Bychykha, Dva Brata [Two Brothers] Mt., against Malyshevskoe in lower reaches of Amur River, Amurstalevskaya Mt., mouth of Gorin River, Kamennaya pad, Khoperskoe; Primorskii Territory: Andreyevka, Anisimovka, 10 km

NW Artem, 10 km SE Chernigovka, Golubinyi Utes [Pigeon cliff] on Lake Khasan, Gornotayezhnoe, Gubero-ovo, Kamen-Rybolov, 20 km NW Kamen-Rybolov, Kedrovaya Pad, 7 km E Khasan, Komarovka River, 40 km E Kraskino, 17 localities in Lazovskii Nature Reserve, Monakino, Novokachalinsk, Lyalichi on Ilistaya River, 4 localities in environs of Partizansk, 15 km NE Pos'et, 20 km SW Putsylovka, Rynda, Samarka, 4 localities in environs of Slavyanka, 5 localities in environs of Spassk, Tigrovyi, Troitsa [The Whitsunday] Bay, 22 km S Turii Rog, 3 localities in environs of Ussurisk, Vasilkovka, Vladivostok; Sakhalin: Yuzhno-Sakhalinsk, 15 km NE Yuzhno-Sakhalinsk, Novikovo, Novo-Aleksadrovsk; Kunashir (Alekhino, Dubovoe, Lake Goryacheye). MONGOLIA: Töv: Songino, Kerulen; Selenge: 25 km E Darhan; Bulgan: Ingenii-daba Pass (33 km S Selenge); Hentiy: 8 km S Norovlin, Sutzukte Gorge; Dornod: Halhin-gol (70 km E Bayan-nur). JAPAN: Sapporo.

**Distribution.** An Eastern Palaearctic widespread subspecies. Russia: Mountain Altai, south of Krasnoyarsk Territory and Irkutsk Province, Buryatia, Yakutia, Chita, Amur and Magadan Provinces, Primorskii and Khabarovsk Territories, Sakhalin; central and eastern Mongolia; Korean Peninsula; northern and northeastern China (Neimenggu, Heilongjiang, and Jilin); northern Japan (Hokkaido and Honshu).

#### 14. *Seladonia (Placidohalictus) placidula* (Blüthgen, 1923)

*Halictus placidulus* Blüthgen, 1923a: 240. . Holotype: , "Chinese Turkestan: Tschakar bei Polu" [CHINA: Xinjiang]; MNB; examined.

**Taxonomy.** Blüthgen, 1931b: 395 ( ), Fig. 21; Ebmer, 1988b: 577; Dawut & Tadauchi, 2002: 140, Pl. 38.

**Material examined.** MONGOLIA (**first record**): Govialtay: Shargyn-gobi (25 km NE Bayan), 16.VI.1980, M.A. Kozlov, 12 ; ZISP.

**Distribution.** Kazakhstan, Turkmenistan, southwestern Mongolia (Govialtay), and northwestern China (Xinjiang).

#### 15. *Seladonia (Seladonia) aeraria* (Smith, 1873)

*Halictus aerarius* Smith, 1873: 201. . Holotype: , JAPAN: Hiogo (Honshu); BML.

*Halictus confluens* Morawitz, 1890: 368. . Lectotype: , CHINA: "Sinin [Qinghai Province], 29.IV, Rob[orowski], "*Halictus confluens* F. Morawitz ",

both labels by Morawitz's hand; **designated here**; ZISP. This is a single specimen from the type series in ZISP. The diagnosis of the species is given in the key to species above. Synonymy by Ebmer (1978a: 190).

*Halictus alexoides* Strand, 1910: 194. . Holotype: , JAPAN (no locality); MNB; examined. Synonymy by Blüthgen (1923c: 242).

*Halictus pseudoconfluens* Strand, 1910: 199. . Syntypes: 4 , 1 , CHINA: Tsingtau [at present Shandong: Qingdao]; MNB; examined. Synonymy (= *H. alexoides*) by Blüthgen (1922: 54).

*Halictus nikkoensis* Cockerell, 1911: 241. . Holotype: , JAPAN: Nikko (Honshu); USMW. Synonymy by Blüthgen (1926a: 405).

*Halictus leucopogon* Strand, 1914: 170. . Syntypes: "Formosa [TAIWAN]: Taihorin"; DEI; examined. Synonymy by Blüthgen (1923c: 241).

*Halictus tsushima* Friese, 1916: 32. . Syntypes: 2 , 1 , JAPAN: Tsushima; MNB; examined. Synonymy (= *H. alexoides*) by Blüthgen (1922: 66).

*Halictus (Seladonia) eruditus* Cockerell, 1924: 581. . Holotype: , RUSSIA: Okeanskaya [near Vladivostok, Primorskii Territory]; USMW. Synonymy by Blüthgen (1926a: 408).

**Taxonomy.** Blüthgen, 1922: 54, 60, 66; 1923c: 241; 1926a: 397, 405, 408; 1934a: 3; Ebmer, 1978a: 190; 1988a: 346; 1996: 269; Fan, 1991: 479 (key), 489 (key); Kim, 1997: 1, Figs. 2-6; Dawut & Tadauchi, 2000: 65-70, Pls. 1-3.

**Published records.** Smith (1873: 201): JAPAN: Honshu: Hiogo. Morawitz (1890: 368; *Halictus confluens*): CHINA: Qinghai: Sinin. Strand (1910: 199; *H. pseudoconfluens*): CHINA: Shandong: "Tsingtau" (Qingdao). Cockerell (1911: 241; *H. nikkoensis*): JAPAN: Honshu: Nikko. Friese (1916: 32; *H. tsushima*): JAPAN: Tsushima (no locality). Cockerell (1924: 581; *H. eruditus*): RUSSIA: Primorskii Territory: Okeanskaya. Gussakovskij (1932: 63): RUSSIA: Primorskii Territory: Sedanka; Suchan. Blüthgen (1934a: 3): CHINA: Gansu: vicinity of Minsiang. Yasumatsu (1934: 62): JAPAN: Yakushima: Ambo-Onoaida. Yasumatsu & Narisada (1935: 65): CHINA: Liaoning: "Dairen" (Dalian). Yasumatsu (1937: 68): JAPAN: Tsushima (5 localities). Okabe (1939: 22): CHINA: "Nordmandschurei (Yungfengchen)". Ebmer (1978a: 190): CHINA: Heilongjiang: Harbin, 34 km N Harbin. Ebmer (1978c: 308): NORTH KOREA (a number of localities in environs of Pyongyang). Ikudome (1978: 320, 322; 1981: 160): JAPAN: Shikoku: (a number of localities in Kôchi Plain). Yamada *et al.* (1990: 37): JAPAN: Hon-



shu: Shimokita, Nambu. Ikudome (1992: 133): JAPAN: Kyushu: Kagoshima. Ikudome & Nakamura (1994: 5): JAPAN: Honshu (a number of localities in Hiroshima Prefecture). Ikudome & Nakamura (1995: 51): JAPAN: Honshu (a number of localities in Gōnokawa Basin). Ebmer (1996: 269): RUSSIA: Primorskii Territory: Partizansk, Samarka, Sedanka, 20 km S Spassk, Suchan, Tamga; Khabarovsk Territory: Khabarovsk. Ikudome & Nakamura (1996: 175): JAPAN: Honshu (a number of localities in Takatsugawa Basin). Ikudome & Nakamura (1997: 20): JAPAN: Honshu (a number of localities in Hiroshima Prefecture). Iwata (1997: 640): JAPAN: Kyushu: Setaura. Kim (1997: 2): SOUTH KOREA (a lot of localities). Dawut & Tadauchi (2000: 70): JAPAN: a lot of localities from Hokkaido, Honshu, Shikoku, Kyushu, and Tsushima. Proshchalykin (2004: 7): RUSSIA: Khabarovsk and Primorskii Territories (no locality).

*Material examined* (199 , 287 ). RUSSIA. Amur Province (**first record**): Blagoveshchensk, 17.VIII.1982, A.S. Lelej, 1 , ZISP; Kundur, 8.VII.1987, A.N. Kupianskaya, 1 , 1 , IBSV, ZISP. Khabarovsk territory: Bereзовка-Nekrasovka, Dva Brata (Two Brothers) Mt., Khabarovsk, Khopersk, Komsomolsk-on-Amur, Myachai Mts., Promyslovka (Sikhote-Alin Ridge), Smidovich, Solnechnyi, Troitskii, 20 km E Vyazemskoe, Shargol. Primorskii Territory: Anisimovka, 15 km NW Artem, Benevskoe, Blagodatnoe, 15 km SE Chernigovka, 15 km E Dmitrievka, Elabuga, Gornotaezhnoe, Lebedinoe, Kamen-Rybolov, Kedrovaya pad, Lake Khanka, Khasan, Kievka, Murav'evka, Novokachalinsk, Okeanskaya, 3 localities in environs of Partizansk, Pos'et, 12 km NW Preobrazhenia Bay, 20 km SW Putsilovo, 5 localities in environs of Slavyanka, 5 localities in environs of Spassk, Suputinka, Tekhmenovo, Ussuriisk, 30 km SE Ussuriisk, Vityaz, Vladivostok, Yakovlevka. MONGOLIA (**first record**): Sühbaatar: 20 km Barunurt, 14.VII.1971, leg. I.M. Kerzhner, 1 ; ZISP. CHINA: Qinghai: Sinin (lectotype of *Halictus confluens*); Shandong: Qingdao (syntypes of *Halictus pseudoconfluens*); 3 localities in Beijing Municipality; Liaoning: 30 km E Sheniang, 50 km N Sheniang; Heilongjiang: Harbin. SOUTH KOREA: Gyeonsangnam Province: 30 km NNW Jinju. JAPAN: Tsushima (syntypes of *Halictus tsushimae*); Honshu: Ibaraki, Inuyama, Kitaibaraki, Kyoto, Osaka; Kyushu: Ohmura.

*Distribution*. Eastern Palaearctic and northern Oriental Regions, from northwestern Tibet in the west, as far as Japan and Taiwan in the east: Mongolia (Sühbaatar), China (Anhui, Beijing, Fujian, Gansu, Hebei, Liaoning, Heilongjiang, Jiangsu, Jilin, Shandong, Shaanxi, Shanxi, Yunnan, and Zheiliang; i.e. except for the west), south

of Russian Far East (Amur Province, Primorskii and Khabarovsk Territories), Korean Peninsula, Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima, Yakushima), Taiwan.

**16. *Seladonia (Seladonia) lucidipennis***  
(Smith, 1853)

*Halictus lucidipennis* Smith, 1853: 62. . Syntypes: “Northern INDIA”; BML.

*Halictus varipes* Morawitz, 1876: 223. . Lectotype: , UZBEKISTAN: Dshizak; designated by Blüthgen (1955: 17); ZMMU; examined. Synonymy by Sakagami & Ebmer (1987: 326).

*Halictus vernalis* Smith, 1879: 30. . Syntype: 1 , “Ceylon” [SRI LANKA]; BML. Synonymy by Ebmer (1980: 483).

*Halictus niloticus* Smith, 1879: 32. “ ” [ ]. Syntype: 1 , SUDAN: White Nile; BML. Synonymy (= *H. varipes*) by Ebmer (1982: 201).

*Halictus magretti* Vachal, 1892: cxxxvii. . Syntype(s): SUDAN: Suakin; MCG. Synonymy (= *H. varipes*) by Ebmer (1982: 201).

*Halictus dives* Pérez, 1895: 52. . Lectotype: , ALGERIA: Biskra; designated by Ebmer (1972b: 600); MNP. Synonymy (*H. varipes* var. *dives*) by Blüthgen (1930b: 221).

*Halictus variipes* Dalla Torre, 1896: 90. Unjustified emendation of *Halictus varipes* Morawitz, 1876.

*Halictus omanicus* Pérez, 1907: 489. . Lectotype: , ARABIAN EMIRATES: Muscat; designated by Ebmer (1972b: 629); MNP. Synonymy (= *H. varipes*) by Blüthgen (1930b: 222).

*Halictus varipes* var. *koptica* Blüthgen, 1933b: 16. . Syntypes: 2 and 17 from a number of localities in EGYPT; MBL, MNB, NMW, and ECC; examined in MNB and NMW. Synonymy (= *H. varipes*) by Ebmer (1982: 201).

*Halictus (Seladonia) sudanicus* Cockerell, 1945: 352. . Holotype: , SUDAN: Shendi; BML. Synonymy (= *H. varipes*) by Ebmer (1982: 201).

*Halictus (Seladonia) tokarensis* Cockerell 1945: 352. . Holotype: , SUDAN: Tokar; BML. Synonymy (= *H. varipes*) by Ebmer (1982: 201).

*Halictus (Seladonia) dissensis* Cockerell, 1945: 353. . Holotype: , SUDAN: Dissa; BML. Synonymy (= *H. varipes*) by Ebmer (1982: 201).

*Halictus (Seladonia) medanicus* Cockerell, 1945: 354. . Holotype: , SUDAN: Medani; BML. Synonymy (= *H. varipes*) by Ebmer (1982: 201).

*Halictus (Seladonia) mogrensis* Cockerell, 1945: 355. .

- Holotype: ♂, SUDAN: Mogren; BML. Synonymy (= *H. varipes*) by Ebmer (1982: 201).
- Halictus (Seladonia) tokariellus* Cockerell 1945: 355. ♂. Holotype: ♂, SUDAN: Tokar; BML. Synonymy (= *H. varipes*) by Ebmer (1982: 201).
- Halictus (Seladonia) medaniellus* Cockerell, 1945: 356. ♂. Holotype: ♂, SUDAN: Medani; BML. Synonymy (= *H. varipes*) by Ebmer (1982: 201).
- Halictus (Seladonia) mogrenensis* Michener, 1978: 528. Unjustified emendation of *Halictus mogrensis* Cockerell, 1945.
- Halictus (Seladonia) morinellus* hyemalus Warncke, 1982: 134. ♂. Holotype: ♂, IRAN: Bandar-Abbas; OLM. Synonymy by Ebmer (1988a: 356).

*Taxonomy* (selected references). Blüthgen, 1926b: 678, 684 (key), 686 (key); 1930b: 221 (*H. varipes* var. *dives*; ♂), 222 (*H. varipes*; ♂); 1931a: 210; 1931b: 326 (*H. lucidipennis* and *H. vernalis*); 1933b: 21 (*H. magretti*), 22 (*H. niloticus*); 1935b: 361 (*H. varipes*); 1955: 17 (*H. varipes*); Ebmer, 1972b: 600, 629; 1980: 483; 1982: 201; 1988a: 356 (*H. varipes*); Sakagami & Ebmer, 1987: 318 (key), 321, many figs.; Pauly, 1999: 146; Dawut & Tadauchi, 2002: 135, Pls. 33-35 (*H. lucidipennis*); 2003: 108, Pls. 51, 52 (*H. varipes*).

*Published records*. Morawitz (1880: 365; *H. varipes*): MONGOLIA (no locality; see “Material”). Blüthgen (1955: 17; *H. varipes*): CHINA: Gansu: “Oase Satschou” (Min-ghoshan).

*Material examined* (2 ♂; ZISP) MONGOLIA: Govialtay: “Adzh Bogdo Ridge” (Aj-Bogd-uul; see Pesenko, 1984: 448).

*Distribution*. Southern Palaearctic and Oriental Regions. North Africa: Cape Verde Islands, Algeria, Tunisia, Libya, Egypt, Sudan; Asia: Israel, Arabian Peninsula, Asia Minor, Iran, Iraq, Afghanistan, Turkmenistan, Kyrgyzstan, Mongolia (Govialtay), northern China (Gansu), Pakistan, India, Nepal, Myanmar, Thailand, Sri Lanka. The records of the species (under the name *Halictus variipes*) from Europe by Strand (1909: 18) and Diniz (1959: 34) were based on misidentification (see Ebmer, 1979: 130).

### 17. *Seladonia (Seladonia) mongolica* (Morawitz, 1880)

*Halictus mongolicus* Morawitz, 1880: 365. ♂. Lectotype: ♂, “MONGOLIA”, “95474” [Govialtay: “Adzh Bogdo Ridge”; = Aj-bogd-uul]; specimen provided with gold circle and the label “mongolicus Mor. Typ.” by Morawitz’s hand; **designated here**; ZISP. In ZISP,

there are also paralectotypes: 4 ♂, Mongolia: “95465;”, “95468”, “95471”, “95472” [Adzh-Bogdo Ridge]. The diagnosis of the species is given in the key to species above.

*Taxonomy*. Blüthgen, 1929: 77, Fig. 7 (♂); 1935a: 113; Ebmer, 1982: 202; 1988a: 350; Fan, 1991: 479 (key); Dawut & Tadauchi, 2002: 129, Pls. 30-32.

*Taxonomic note*. The individual, on the basis of which Blüthgen (1929: 77) described the male of *S. mongolica*, has been rather exposed to potassium cyanide for a long time. As a result of this influence, the yellow pattern on the clypeus and legs was changed to reddish; the mesosoma partly and metasoma entirely became reddish brown. In normal individuals, the clypeus possesses a yellow band along the posterior margin, the mesosoma entirely and most of the metasoma are metallic green.

*Published records*. Morawitz (1880: 366): MONGOLIA (no locality [Govialtay: “Adzh Bogdo Ridge” = Aj-Bogd-uul]). Blüthgen (1929: 77): CHINA: Qinghai: southern shore of Kuku-nor. Ebmer (1982: 202): MONGOLIA: Hovd: Bulgan-gol, Jarantaj, Conocharajch-gol, Chaar-nuur, Chojidalaj-nuur, Bayan-Hongor: Ich-Bogd. Dawut & Tadauchi (2002: 134): MONGOLIA: Bayan-Hongor: Ich-bogd. Ebmer (2005: 361): RUSSIA: Buryatia: Ust-Kyakhta; MONGOLIA: Hovd: Bulgan-gol, Jaranta, Chord-gol, Ulaan-uul; Uvs: 30 km S Ulaan-gom, Charchiraa, Chan chou goor-Somon, 100 km SW Dalanzadgad; Bayan-Hongor: 130 km S Bayanhongor, 95 km S Bayanhongor, 75 km S Bayanhongor, 2 km S Bayanhongor, 16 km NW Bayanhongor; Övör-Hangay: 159 km SW Arvaykheer, 137 km NE Arvaykheer, 143 km NE Arvaykheer.

*Material examined* (15 ♂, 50 ♀). RUSSIA: Buryatia: Kyakhta. MONGOLIA: Govialtay: Aj-bogd-uul (lectotype and 4 paralectotypes), Shargyn Govi (25 km NE Bayan), 20 km SW Sharga, 15 km WNW Dzahuy; Hovd: 25 km N Bulgan, 25 km SSW Yench, 50 km SSW Yench, 30 km N Ich-navhiin-nur, 12 km SW Altay, 20 km SE Altay; Ömnögov: 40 km ESE Han-bogd, 30 km E Dun-gol, Dzemgin Govi (25 km SW Hailastyn-huduk, 85 km W Tarvagai, 40 km S Noön-Somon; Hentiy: 10 km SSW Buyant; Hövsgöl: Ehin-gol; Övör-Hangay: eastern shore of Tatsyn-tsagan-nur; Sühbaatar: 20 km E Barun-urt, 7 km W Hongor; Bayan-Hongor: Tuin-gol near Bogd-ula Somon, 25 km SW Shara-hulsny-bulak; Dornodgov: Dolotyn-huduk, 10 km E Dzun-bayan, Tushilge Mt., 10 km SSW Sain-shand, 50 km SSW Nudegiin-hural, Nomt-ula (30 km SSE Shohoi-nur), 20 km N Dalan-Jargakan; 5 km W Tenger-nur, 23 km WSW



Bayan-munh, 55 km SE Hara-airag; Dornod: 10 km W Buhyn-hashatyn-huduk. CHINA: Qinghai: southern shore of Kuku-nor.

*Distribution.* Russia (Buryatia), Mongolia, and China (Xinjiang, Qinghai).

**18. *Seladonia (Seladonia) mugodjarica***  
(Blüthgen, 1933)

*Halictus mugodjaricus* Blüthgen, 1933a: 74. . Holotype: , KAZAKHSTAN: Ber Chogur in Mugodzhary Mts. [Aktyube Province]; MNB; examined.

*Halictus (Seladonia) exquisitus* Warncke, 1975: 105, 120. . Holotype: , TURKEY: Tuz Gölü; OLML. Synonymy by Ebmer (1988a: 350).

*Taxonomy.* Ebmer, 1988a: 350.

*Published records.* Ebmer (2005: 361): MONGOLIA: Ömnögovı: 159 km SW Arvaykhar.

*Distribution.* Asia Minor, central and eastern Kazakhstan, southern Mongolia (Ömnögovı).

**19. *Seladonia (Seladonia) nikolskayae* Pesenko, sp. n.**

*Holotype:* , RUSSIA, Primorskii Territory, Kedrovaya Pad, 26.VII.1961, leg. M.N. Nikolskaya [label in Russian]; ZISP.

*Diagnosis.* In the shape, sculpture and coloration of the head and mesosoma, the new species is very similar to such members of the subgenus *Pachyceble* as *S. gavarnica* and *S. transbaikalensis*. Only the short antenna and flat S6 are indicators of the true membership of the species. In the shape of the head, *S. nikolskayae* occupies an isolated position in the subgenus *Seladonia*. In the general structure of the gonostyli, *S. nikolskayae* is close to the Western Palearctic *S. subaurata* (Rossi), Northern Chinese *S. pjalmensis* (Strand) (see below) and Oriental *S. propinqua* (Smith), slightly differing from them in the shape of the medial lobe of the upper gonostylus, that of *S. nikolskayae* is somewhat widened in the distal half.

**Male.** *Structure.* Body length 6.5 mm. Head 1.12 times as high as wide (Fig. 32), egg-shaped in front view. Clypeus 1.2 times as wide (estimated as distance between anterior tentorial pits) as high; entirely placed below eyes. Genal area / eye width ratio about 1.5 in lateral view to head. Malar space linear. Antenna very short, reaching only scutellum. 2nd-5th flagellomeres about 1.1 times as long as their diameters (Fig. 39). Mesoscutum straight at anterior margin. Metapostnotum triangular, about as long as scutellum (Fig. 47), separated

from punctate upper parts of lateral surfaces of propodeum by wide polished stripe. Hind tarsus relatively robust (Fig. 49). Metasoma elongate elliptical. Posterior areas of terga narrow, slightly depressed along all their width. Discs of terga weakly convex. Medial lobe of upper gonostylus nearly as long as main body of gonostylus, relatively narrow, slightly widened in diastal half, narrowly rounded at apex, slightly curved, provided with several long hairs in both sides of distal half (Fig. 77). Lower gonostylus somewhat shorter than upper gonostylus, relatively narrow, arc-wise in lateral view (Fig. 78).

*Sculpture.* Clypeus uniformly punctate (30-35  $\mu\text{m}$  / 0.3-0.8), polished on interspaces. Frons, paraocular areas and vertex very densely punctate, mat. Genal areas obscurely roughened, with obscure and relatively dense punctation, weakly shiny. Mesoscutum uniformly densely punctate (15-20  $\mu\text{m}$  / 0.2-0.4), shiny on interspaces. Mesopleura densely granulate, mat. Metapostnotum rather granulate, mat, with weak sparse short undulating wrinkles. Lateral and posterior vertical surfaces of propodeum smooth along posterior margin of metapostnotum; rest of these surfaces mat, roughened and densely punctate. T1 on most of surface distinctly and sparsely punctate (15  $\mu\text{m}$  / 0.3-1.5, sometimes 2.0), polished on interspaces; subsequent terga somewhat more finely and obscurely punctate.

*Coloration.* Body dark metallic blue-green. Clypeus on lower third and labrum yellow; mandibles entirely dark. Scape and pedicel of antenna dark brown; flagellum ochre on lower side, dark brown on upper side. Tegula brownish infusate. Coxae, trochanters, femora and large spots on middle and hind tibiae black; rest of legs yellow.

*Pubescence.* Face, genal area and sides of mesosoma covered with whitish erect plumose hairs. Vertex and dorsal surface of mesosoma (except for bare metapostnotum) pubescent with brownish erect hairs. Metasomal terga with weakly developed (narrow, sparse and widely interrupted in middle) posterior bands and without anterior bands.

**Female** unknown.

*Etymology.* This species is named for the late Maria N. Nikolskaya (ZISP), a collector of the holotype, a scholar of authority in Chalcidoidea.

**20. *Seladonia (Seladonia) pjalmensis***  
(Strand, 1909)

*Distribution.* *S. pjalmensis* (Strand, 1909) occurs in southwestern Mongolia and northwestern China. It is

considered to be consisting of two subspecies, each of which is known only from the types examined by me. *S. pjalmensis pjalmensis* (= *Halictus subauratovestitus* Blüthgen, 1929) was described from two localities ("Pjalma" = Hotan and "Kaschgar" = Kashi) in Xinjiang; *S. pjalmensis gaschunica* (see below), from "Oase Satschou" [at present, Dunhuang = Minghoshan] in Gansu. The later differs from the nominotypical subspecies in the following characters. In female, head somewhat shorter, metapostnotum with wide smooth stripe along posterior margin, antenna and tibiae paler, T1 and T2 entirely covered with tomentum; in male, flagellum on lower side and tibiae paler, mesoscutum more finely punctate.

**20a. *Seladonia (Seladonia) pjalmensis gaschunica***  
(Blüthgen, 1935)

*Halictus pjalmensis gaschunicus* Blüthgen, 1935: 111. Lectotype: , CHINA: "Oase Satschou" [at present Dunhuang = Minghoshan], Gashun Gobi, [Gansu Province], 1-3.viii.1895, [leg.] Rob[orowski & Kozlov]; specimen provided with gold circle, red printed label "P-Type" and label "*Hal. subauratovestitus*" by Blüthgen's hand; **designated here**; ZISP. In ZISP, there are also paralectotypes: 1 , label as in lectotype; 1 , same locality, 28.vii.1895. The diagnosis of the subspecies is given above in the key to species.

**Taxonomic note.** This female designated here as the lectotype was indicated as a paratype of *H. subauratovestitus* by Blüthgen (1929: 80); but later this author (Blüthgen, 1935a: 111) has included it in the type series of *Halictus pjalmensis gaschunicus* Blüthgen, 1935.

**Taxonomy.** Ebmer, 1988a: 345; Dawut & Tadauchi, 2003: 100, Pls. 46, 47.

**Published records.** Blüthgen (1935a: 111): CHINA: Gansu: "Oase Satschou" (Min-ghoshan).

**Material examined** (♂, ). MONGOLIA (**first record**): Govialtay: Shargyn Govi (25 km NE Bayan), 23.VIII.1967, V.F. Zaitsev, 6 ♂; ZISP. CHINA: Gansu: Minghoshan (lectotype and 2 paralectotypes).

**Distribution.** Southwestern Mongolia (Govialtay), northern China (Gansu).

**21. *Seladonia (Seladonia) semitecta***  
(Morawitz, 1874)

*Halictus semitectus* Morawitz, 1874: 172. Lectotype: , RUSSIA: "Derbent" [Daghestan]; specimen provided with gold circle and the label "*semitectus*. Mor.

Typ." by Morawitz's hand; **designated here**; in St. Petersburg. References to diagnoses are given in Section "Taxonomy" below. In ZISP, there are also paralectotypes from Derbent: 2 and 2 .

**Taxonomy.** Blüthgen, 1920: 104 (key), 130 (key); 1924: 536 (key); 1930a: 748 (key), 765 (key); Ebmer, 1969: 153 (key), 155 (key), 170; 1988a: 332 (key), 336 (key), 350, Figs. 38, 42, 63, 64, 68; Pesenko et al., 2000: 170 (key), 175, Fig. 253; Dawut & Tadauchi, 2002: 127, Pls. 28, 29.

**Published records.** Blüthgen (1934a: 3): CHINA: Gansu: vicinity of Minsiang. Ebmer (1982: 202): MONGOLIA: Uvs: Charchiraa, 30 km S Ulaabgom; Bayan-Hongor: Ich-bogd. Dawut & Tadauchi (2002: 128): MONGOLIA: Bayan-Hongor: Ich-bogd; Uvs: 30 km S Ulaangom. Ebmer (2005: 362): MONGOLIA: Uvs: Charchiraa.

**Material examined** (109 , 70 ). RUSSIA: Buryatia (**first record**): Kyakhta; Chita Province (**first record**): 20 km NE Solov'evsk, 25 km N Solov'evsk, Karymskaya, Urulyungui, Zabaikalsk; Khabarovsk Territory (**first record**): Khabarovsk, Sikhote-Alin Mts.; Primorskii territory (**first record**): Novokachalinsk; Samarka; Spassk. MONGOLIA: Ubs: 10 km SE Muren, 20 km N Ulga; 15 km SSE Taralyan; Bayan-Hongor: northern clope of Ich-Bogd-ula; Hovd: 15 km SW Hovd, 12 km SW Altay; Dzavhan: 10 km WNW Erdene-hayran, eastern corner of Telmen-nur; Hövsgöl: 30 km NW Tsetserleg-Somon; Selenge: 25 km E Darhan; Töv: 30 km N Erdene-huduk, northern slope of Bogdo-ula near Ulanbaatar, 125 km SW Ulanbaatar, Songino, 25 km SSE Bayan, Kerulen; Dundgovi: 25 km WSW Mandal-govi, 20 km W Lus-Somon; Ömnögov: 9 km SSW Tsigt-obo, 40 km S Bulgan; Hentiy: 45 km E Bayan-obo, 15 km N Buyant, 10 km SSW Buyant, 12 km N Gulshir, 8 km S Norovlin; Dornodgovi: 30 km SSE Shohoi-nur, 20 km N Dalanjargalan, 60 km NW Choir, 45 km SE Bayan-muht; Dornod: Tamsag-bulak, 30 km W Tamsag-bulak, 65 km SE Tamsag-bulak, 30 km ENE Tsagan-ula, 20 km WNW Sangin-dalai-nur, 32 km SE Salhit Mt., 50 km WSW Salhit Mt., 75 km WSW Salhit Mt., eastern corner of Buin-nur, 33 km SE Halhgal-Somon; 12 km SW Halhgal-Somon, Bayan-dun, Cholbai-sai, 10 km NE Gurvan-dzagal, 60 km ENE Bayan-burd, 10 km NE Havirga, 30 km NNE Havirga, 7 km S Erentsav, 15 km SW Ich-chulut-ula, 45 km SSW Ich-chulut-ula, Matad, 18 km NE Dash-balbar, 13 km W Dash-balbar, Dzavsar-bulak; Sühbaatar: 30 km WNW Dariganga, 20 km NE Dariganga, 20 km E Barun-urt, 80 km NNE Barun-urt, 22 km WNW Bayan-delger, 25 km NW Bayan-delger, Dzotol-han-ula. CHINA: Nei-

menggu (**first record**): «Syelchi River, Major Hingan Mts., 27.VIII.1899, leg. Soldatov», 1 ♀; «Luhyn-Sume Road, 26.VI.1899, leg. Soldatov», 1 ♀; ZISP.

*Distribution.* Steppes and forest-steppe of Eurasia from southeastern Germany as far in the east as eastern Mongolia and Primorskii Territory of Russia. Europe: southeastern Germany, Austria, Lithuania, Hungary, Ukraine, south of European Russia, southern Urals; Asia: Russia (Buryatia, Chita Province, Khabarovsk and Primorskii Territories), Mongolia, China (Xinjiang, Gansu, Neimenggu). The record of the species from Turkey by Strand (1909: 15) belongs to *S. smaragdula* (see Warncke, 1975: 105).

**22. *Seladonia (Vestitohalictus) gobiensis***  
(Ebmer, 1982), **status n.**

*Halictus (Vestitohalictus) pseudovestitus gobiensis* Ebmer, 1982: 206, Figs. 8, 9. . Holotype: ♀, CHINA: “Oase Satcshou, Gashun Gobi” [at present, Dunhuang = Min-ghoshan; Gansu]; MNB; examined.

*Taxonomic note.* Here I accept the opinion of P. Blüthgen, who (judging from his determination labels) intent to describe “*Halictus gobiensis*” as a separate species (but he did not publish its description). Ebmer’s consideration of this taxon a subspecies of *Halictus pseudovestitus* contradicts the data on both the morphology and distribution. In the female, *S. gobiensis* is much more similar to *S. pulverea* than to *S. pseudovestita* (see the key above). In the male, *S. gobiensis* distinctly differs from *S. pseudovestita* in the body size and also in the coloration and pubescence. The collection localities of *S. pseudovestita* in Mongolia indicated by Ebmer (1982: 206; in Bayan-Hongor; see below) are situated much more close to the type locality of *S. gobiensis* (Minghoshan in Chinese Gansu) than the type locality of *S. pseudovestita* (Beijing).

I would like also notice that the difference in the structure of the male genitalia between *S. gobiensis* and *S. pulverea* given by Ebmer (1988b: Figs. 9 and 10 on p. 574 and text on p. 576) is wrong on the following reasons. On Fig. 9 by Ebmer, the medial lobe of the gonostylus in the lectotype of *S. pulverea* is situated in the middle of the main body of the gonostylus, crossing the latter and as if dividing it half. First, such a shifted position of the medial lobe is strongly overstated on Fig. 9; in fact, the lobe in the lectotype is situated much more close to medial margin of the main body of the gonostylus. Second, this position of the medial lobe is artifact, appearing as a result of preparation. This was estab-

lished by me studying the genitalia in a number of males from Mongolia. Hence, all the three Eastern Palearctic species of the subgenus *Vestitohalictus*, *S. gobiensis*, *S. pseudovestita*, and *S. pulverea*, are not distinguished in the structure of the male genitalia.

*Published records.* Ebmer (1982: 206): CHINA: Gansu: “Oase Satcshou” (Minghoshan), Shigusa.

*Material examined* (18 ♀, 10 ♂). MONGOLIA (**first record**): Bayan-Hongor, Echin-gol, 50 km NNE Taganbogd Mt., 13 ♀, 4 ♂; ZISP. CHINA: Gansu: Minghoshan, Shigusa (including holotype and 4 paratypes in MNB and 6 specimens provided with “paratype” labels by P. Blüthgen in ZISP).

*Distribution.* Southern Mongolia (Bayan-Hongor), northwestern and northern China (Xinjiang, Gansu).

**23. *Seladonia (Vestitohalictus) pseudovestita***  
(Blüthgen, 1925)

*Halictus pseudovestitus* Blüthgen, 1925: 126. . Holotype: ♀, CHINA: “Peking” [Beijing]; MNB; examined.

*Taxonomy.* Ebmer, 1978a: 190; 1982: 206 ( ), Fan, 1991: 479 (key), 480 (key).

*Published records.* Blüthgen (1925: 126): CHINA: Beijing. Ebmer (1978a: 190): CHINA: Heilongjiang: Harbin. Ebmer (1982: 206): MONGOLIA: Bayan-Hongor: Ich-bogd.

*Material examined* (7 ♀, 7 ♂). MONGOLIA: Govialtay: 10 km NW Hatan-hayran Mt.; Bayan-Hongor: Shara-hulsny-bulak; 30 km NNE Shara-hulsny-bulak; Ömnögovi: 20 km WSW Une-huduk, 40 km ESE Hanbogd), Dornodgovi: 30 km SSE Shohoi-nur), Dornod: Tamsag-bulak.

*Distribution.* Southern and eastern Mongolia (Govialtay, Bayan-Hongor, Ömnögovi, Dornodgovi, Dornod), northeastern China (Heilongjiang, Beijing).

**24. *Seladonia (Vestitohalictus) pulverea***  
(Morawitz, 1874)

*Halictus pulvereus* Morawitz, 1874: 168. . Lectotype: ♀, RUSSIA: Derbent (Daghestan); designated by Ebmer (1988b: 576); ZISP; examined.

*Halictus sogdianus* Morawitz, 1876: 216 (key), 227. . Lectotype: ♀, UZBEKISTAN: Samarkand; designated by Blüthgen (1934b: 303); ZMMU; examined. Synonymy by Ebmer (1988b: 576).

*Nomioides aenescens* Radoszkowski, 1893: 57. . Syn-types: 4 ♀, TURKMENISTAN: Ashkhabat; MNB and

IZK; examined. Synonymy (= *H. sogdianus*) by Blüthgen (1934b: 303).

*Taxonomy* (selected references). Ebmer, 1988b: 576, Figs. 8, 9; 2005: 368.

*Published records*. Morawitz (1890: 369): CHINA: Gansu: “südliche Mongolei: Zagan-Burjuk”. Ebmer (1982: 205): MONGOLIA: Hovd: Bulgan-gol; Bayan-Hongor: Ich-bogd. Ebmer (2005: 368): MONGOLIA: Hovd: Ulaan-uul, Bulgan-Somon, Hovd, Jarataj; Bayan-Hongor: 130 km S Bayanhongor.

*Material examined* (3, 5). MONGOLIA: Hovd: 15 km E Mergen-uul, Nariin-bulak, Ich-navtgiin-nur, 25 km SSW Yench, 25 km N Bulgan; Ömnögov: 20 km WSW Une-huduk, 6 km Han-bogd.

*Distribution*. Daghestan, Cyprus, Asia Minor, Near East, Middle Asia, Iran, Afghanistan, western Mongolia (Hovd, Bayan-Hongor, Ömnögov), northern China (Gansu).

### Discussion: distributional patterns

The Eastern Palaearctic fauna of the genus *Seladonia* is relatively rich. It consists of 24 species, nearly a fourth of the world fauna of the genus. The genus *Seladonia* is represented in the Eastern Palaearctic Region by diverse zoogeographical (chorological) elements, with species having very different geographical ranges. Seven species are widespread: Holarctic polyzonal *S. confusa*; transpalaearctic polyzonal *S. gavarica*, *S.*

**Table 1.** Occurrence of *Seladonia* species in Eastern Palaearctic Region

Species	Eastern Siberia	Russian Far East	Mon- golia	Northern China	Eastern China	Korean Peninsula	Japan
<i>S. aeraria</i>		+	+	+	+	+	+
<i>S. argilos</i>			+	+			
<i>S. confusa</i>	+	+	+		+		
<i>S. dorni</i>			+				
<i>S. gavarica</i>		+	+				
<i>S. gobiensis</i>			+	+			
<i>S. indefinita</i>			+				
<i>S. leleji</i>		+					
<i>S. leucahenea</i>	+	+	+	+	+		
<i>S. lucidipennis</i>			+	+			
<i>S. mondaensis</i>	+	+	+				
<i>S. mongolica</i>	+		+	+			
<i>S. mugodjarica</i>			+				
<i>S. nikolskayae</i>		+					
<i>S. opacoviridis</i>				+	+		
<i>S. petraea</i>			+				
<i>S. pjalmensis</i>			+	+			
<i>S. placidula</i>			+				
<i>S. pollinosa</i>			+	+			
<i>S. pseudovestita</i>			+		+		
<i>S. pulverea</i>			+	+			
<i>S. semitecta</i>	+	+	+	+			
<i>S. transbaikalis</i>	+		+				
<i>S. tumulorum</i>	+	+	+	+	+	+	+
Total	7	9	21	12	6	2	2



*leucahenea* and *S. tumulorum*; transpalearctic, mostly steppe *S. semitecta*; nearly transpalearctic, desert and steppe *S. pollinosa*; Southern Palearctic and Oriental *S. lucidipennis*; and Eastern Palearctic and Northern Oriental *S. aeraria*. Four species are Western Palearctic, only penetrating to the west of the Eastern Palearctic Region: *S. indefinita*, *S. mugodjarica*, *S. pulvereae*, *S. petraea* and *S. placidula*. *S. mondaensis* is an inhabitant of the "Strongly Continental Sector" of Eastern Asia, including Buryatia, Tuva, Yakutia, the Magadan Province of Russia, and central Mongolia. However, a third of the Eastern Palearctic fauna of the genus *Seladonia* (eight species) is represented by species endemic to the Gobi Desert Subregion, in the wider understanding of this term, or to part of this subregion: *S. argilos*, *S. dorni*, *S. gobiensis*, *S. mongolica*, *S. opacoviridis*, *S. pjalmensis*, *S. pseudovestita* and *S. transbaikalisensis*. Newly described in the present paper, *S. leleji* and *S. nikolskayae* can be considered conditional endemics to the south of the Eastern Palearctic Region (the Primorskii Territory of Russia).

Of course, the amount of data on the distribution of *Seladonia* species in the region under study is scanty. Nine species of *Seladonia* found in the Eastern Palearctic Region are known only from the types, *S. leleji*, *S. nikolskayae*, and *S. opacoviridis*, or mainly from the types *S. argilos*, *S. dorni*, *S. gobiensis*, *S. mugodjarica*, *S. petraea* and *S. pjalmensis*. One would expect the actual occurrence of these many species to be much wider than that indicated by the current knowledge of the group. The occurrence of *Seladonia* species in different countries and parts of the Eastern Palearctic Region as shown by available data is given in the Table below. The fauna of Mongolia includes the most number of species (20), whilst the faunas of the Korean Peninsula and Japan are the poorest (each with two species).

### Acknowledgments

For the possibility of study of the types, I wish to thank the curators of museum collections and owners of personal collections listed in the introduction of the paper. Also I am very grateful to Prof. I.M. Kerzhner (ZISP) and Dr. A.S. Lelej (IBSV) for useful advices and help in establishing the current names of some localities in Mongolia, China and Japan.

### References

Alfken, J.D., 1905. Zweiter Beitrag zur Synonymie der Apiden. (Hym.). *Z. syst. Hymenopterol. Dipterol.*, **5**(3):

145-146.

Blüthgen, P., 1920. Die deutschen Arten der Bienengattung *Halictus* Latr. (Hym.). *Dt. Entomol. Z.*, **1920/1921**(1/2): 81-132.

Blüthgen, P., 1921. Die schweizerischen *Halictus*-Arten der Frey-Gessner'schen Sammlung (Hym., Apidae). *Mitt. Schweiz. Entomol. Ges.*, **13**(3/4): 122-143.

Blüthgen, P., 1922. Beiträge zur Synonymie der Bienengattung *Halictus* Latr. [I]. *Dt. Entomol. Z.*, **1922**(1): 46-66.

Blüthgen, P., 1923a. Beiträge zur Kenntnis der Bienengattung *Halictus* Latr. *Archiv Naturg. Abt. A*, **89**(5): 232-332.

Blüthgen, P., 1923b. Beiträge zur Systematik der Bienengattung *Halictus* Latr. (Hym.). I. Die Binden-*Halictus* (Gruppe des *sexcinctus* F.). *Konowia*, **2**(1-2): 65-81; (3-4): 123-142.

Blüthgen, P., 1923c. Beiträge zur Synonymie der Bienengattung *Halictus* Latr. III. *Dt. Entomol. Z.*, **1923**: 239-242.

Blüthgen, P., 1924. Contribución al conocimiento de las especies españolas de "*Halictus*" (Hymenoptera, Apidae). *Mem. R. Soc. Españ. Hist. Nat.*, **11**(9): 332-544.

Blüthgen, P., 1925. Beiträge zur Kenntnis der Bienengattung *Halictus* Latr. II. *Archiv Naturg. Abt. A*, (1924), **90**(10): 86-136.

Blüthgen, P., 1926a. Beiträge zur Kenntnis der indo-malaysischen *Halictus*- und *Thrinchostoma*-Arten (Hym. Apidae. Halictinae.). *Zool. Jb. Abt. Syst.*, **51** (4/6): 375-698.

Blüthgen, P., 1926b. Beiträge zur Synonymie der Bienengattung *Halictus* Latr. IV. *Dt. Entomol. Z.*, **1925**(5): 385-419.

Blüthgen, P., 1929. Neue turkestanische *Halictus*-Arten (Hym. Apidae). *Konowia*, **8**(1): 51-86.

Blüthgen, P., 1930a. *Halictus* Latr. pp. 729-767. In Schmiedeknecht, O. (ed.). *Die Hymenopteren Nord- und Mitteleuropas*. Jena :G. Fischer.

Blüthgen, P., 1930b. Neue oder wenig bekannte *Halictus*-Arten aus Nordafrika, insbesondere aus der Cyrenaica (Hym. Apidae). *Mem. Soc. Entomol. Ital.*, **9**(2): 215-227.

Blüthgen, P., 1931a. Beiträge zur Synonymie der Bienengattung *Halictus* Latr. VII. (Hym. Apid.). *Dt. Entomol. Z.*, **1930**(4): 209-215.

Blüthgen, P., 1931b. Beiträge zur Kenntnis der Bienengattung *Halictus* Latr. III. *Mitt. zool. Mus. Berlin*, **17**(3): 319-398.

Blüthgen, P., 1933a. Neue paläarktische *Halictus*-Arten (Hym., Apidae). I. Grüne Binden *Halictus*. *Dt. Entomol. Z.*, **1933**: 72-80.

Blüthgen, P., 1933b. Ein Beitrag zur Kenntnis der Bienenfauna Ägyptens (Hymenoptera-Apidae-Halictidae-Halictinae). *Bull. Soc. R. Entomol. Egypte*, **17**(1-3): 14-27.

Blüthgen, P., 1934a. Schwedisch-chinesische wissenschaftliche Expedition nach den nordwestlichen Provinzen Chinas unter Leitung von Dr. Sven Hedin und Prof. Sü Ping-chang: Insekten, gesammelt vom schwedischen Arzt der Expedition. Dr. David Hummel 1927-1930. 27. Hymenoptera. 5. *Halictus*- und *Sphecodes*-Arten (Hym.; Apidae; Halictini). *Arkiv Zool.*, **27A**(13): 1-23.

Blüthgen, P., 1934b. Beiträge zur Synonymie der Bienengattung *Halictus* Latr. IX. *Dt. Entomol. Z.*, **1933**(2/3): 299-304.

Blüthgen, P., 1935a. Neue paläarktische *Halictus*-Arten (Hym., Apidae). [II]. *Dts. Entomol. Z.*, **1935**(1/2): 111-120.

Blüthgen, P., 1935b. *Halictus*, *Nomioides* und *Sphecodes*. In Popov, V.B. [A contribution to the bee fauna of Tajikistan]. *Trudy Tadzhik. Bazy AN SSSR*, **5**: 360-367. (In Russian.)



- Blüthgen, P., 1938. Neue Halictini aus Cypern (Hym., Apidae, Halictinae). *Konowia*, (1937) **16**(1): 41-54.
- Blüthgen, P., 1955. The Halictinae (Hymen., Apoidea) of Israel. I. Genus *Halictus* (subgenera *Halictus* s. str. and *Thrincohalictus*). *Bull. Res. Council Israel. Ser. B*, **5**(1): 5-23.
- Blüthgen, P., 1961. Ergebnisse der Deutschen Afghanistan Expedition 1956 der Landessammlungen für Naturkunde Karlsruhe. Diploptera und Apoidea (partim) (Hymenoptera). *Beitr. Naturk. Forschung Südwestdeutschland*, **19**(3): 277-287.
- Cockerell, T.D.A., 1911. Bees in the collection of the United States National Museum. 2. *Proc. U.S. Natn. Mus.*, **40**(1818): 241-264.
- Cockerell, T.D.A., 1922. Descriptions and records of bees. XCVI. *Ann. Mag. Nat. Hist. Ser. 9*, **10** (59): 544-550.
- Cockerell, T.D.A., 1924. Descriptions and records of bees. CIII. *Ann. Mag. Nat. Hist. Ser. 9*, **14**(84): 577-585.
- Cockerell, T.D.A., 1925. Some halictine bees from the Maritime Province of Siberia. *Proc. U.S. Natn. Mus.*, **68**(2607): 1-12.
- Cockerell, T.D.A., 1929. Descriptions and records of bees. CXX. *Ann. Mag. Nat. Hist. Ser. 10*, **4**(24): 584-594.
- Cockerell, T.D.A., 1945. Descriptions and records of bees. CXC VII. *Ann. Mag. Nat. Hist. Ser. 11*, **12**(89): 350-356.
- Dalla Torre, C.G. de. 1896. *Catalogus Hymenopterorum. Hucusque Descriptorum Systematicus et Synonymicus. Vol. X. Apidae (Anthophila)*. Lipsiae: Engelmann, viii + 643 pp.
- Dawut, A. & O. Tadauchi, 2000. A systematic study of the subgenus *Seladonia* of the genus *Halictus* in Asia (Hymenoptera, Apoidea, halictidae). I. *Esakia*, (40): 63-79.
- Dawut, A. & O. Tadauchi, 2002. A systematic study of the subgenus *Seladonia* of the genus *Halictus* in Asia (Hymenoptera, Apoidea, Halictidae). III. *Esakia*, (42): 121-150.
- Dawut, A. & O. Tadauchi, 2003. A systematic study of the subgenus *Seladonia* of the genus *Halictus* in Asia (Hymenoptera, Apoidea, Halictidae). IV. *Esakia*, (43): 97-131.
- Diniz, M.A. de, 1959. Estado actual do conhecimento dos Himenópteros de Portugal. *Mem. Est. Mus. Zool. Univ. Coimbra*, **259**: 1-42.
- Ebmer, A.W., 1969. Die Bienen des Genus *Halictus* Latr. s. l. im Großraum von Linz (Hymenoptera, Apidae). Systematik, Biogeographie, Ökologie und Biologie mit Berücksichtigung aller bisher aus Mitteleuropa bekannten Arten. Teil I. *Naturk. Jb. Stadt Linz*, **1969**: 133-183.
- Ebmer, A.W., 1972a. Neue westpaläarktische Halictidae (Halictinae, Apoidea). *Mitt. Zool. Mus. Berlin*, **48**(2): 225-263.
- Ebmer, A.W., 1972b. Revision der von Brullé, Lucas und Pérez beschriebenen westpaläarktischen *Halictus*-Arten (Halictidae, Halictinae, Apoidea), sowie Festlegung des Lectotypus von *Lasioglossum* (*Evylaeus*) *angustifrons* (Vachal). *Polskie Pismo Entomol.*, **42**(3): 589-636.
- Ebmer, A.W., 1975. Neue westpaläarktische Halictidae (Halictinae, Apoidea), Teil II. - Die Gruppe des *Halictus* (*Vestitohalictus*) *mucoreus* (Ev.). *Mitt. Zool. Mus. Berlin*, **51**(2): 161-177.
- Ebmer, A.W., 1976a. *Halictus* und *Lasioglossum* aus Marokko. *Linzer Biol. Beitr.*, **8**(1): 205-266.
- Ebmer, A.W., 1976b. Liste der mitteleuropäischen *Halictus*- und *Lasioglossum*-Arten. *Linzer Biol. Beitr.*, **8**(2): 393-405.
- Ebmer, A.W., 1978a. Die Halictidae der Mandschurei (Apoidea, Hymenoptera). *Bonner Zool. Beitr.*, **29**(1-3): 183-221.
- Ebmer, A.W., 1978b. *Halictus*, *Lasioglossum*, *Rophites* und *Systrophia* aus dem Iran (Halictidae, Apoidea) sowie neue Arten aus der Paläarkt. *Linzer Biol. Beitr.*, **10**(1): 1-109.
- Ebmer, A.W., 1978c. Die Bienen der Gattungen *Halictus* Latr., *Lasioglossum* Curt. und *Dufourea* Lep. (Hymenoptera, Halictidae) aus Korea. *Ann. Hist. Nat. Mus. Natn. Hung.*, **70**: 307-319.
- Ebmer, A.W., 1979. Ergänzungen zur Bienenfauna Iberiens. Die Gattungen *Halictus*, *Lasioglossum* und *Dufourea* (Apoidea, Hymenoptera). *Linzer Biol. Beitr.*, **11**(1): 117-146.
- Ebmer, A.W., 1980. Asiatische Halictidae (Apoidea, Hymenoptera). *Linzer Biol. Beitr.*, **12**(2): 469-506.
- Ebmer, A.W., 1982. Zur Bienenfauna der Mongolei. Die Arten der Gattungen *Halictus* Latr. und *Lasioglossum* Curt. (Hymenoptera: Halictidae). Ergebnisse der mongolisch-deutschen biologischen Expeditionen seit 1962, Nr. 108. *Mitt. Zool. Mus. Berlin*, **58**(2): 199-227.
- Ebmer, A.W., 1984. Asiatische Halictidae, II. (Apoidea, Hymenoptera). *Ann. Hist. Nat. Mus. Natn. Hung.*, (1983), **75**: 313-325.
- Ebmer, A.W., 1985a. Neue westpaläarktische Halictidae V. (Hymenoptera, Apoidea) sowie Festlegung von Lectotypen von Morawitz beschriebener, bisher ungeklärter *Halictus*-Arten. *Linzer Biol. Beitr.*, **17**(1): 197-221.
- Ebmer, A.W., 1985b. *Halictus* und *Lasioglossum* aus Marokko (Hymenoptera, Apoidea, Halictidae). Erster Nachtrag. *Linzer Biol. Beitr.*, **17**(2): 271-293.
- Ebmer, A.W., 1988a. Die europäischen Arten der Gattungen *Halictus* Latreille 1804 und *Lasioglossum* Curtis 1833 mit illustrierten Bestimmungstabellen (Insecta: Hymenoptera: Apoidea: Halictidae: Halictinae). 2. Die Untergattung *Seladonia* Robertson 1918. *Senckenberg. Biol.*, (1987), **68**(4/6): 323-375.
- Ebmer, A.W., 1988b. Kritische Liste der nicht-parasitischen Halictidae Österreichs mit Berücksichtigung aller mitteleuropäischen Arten (Insecta: Hymenoptera: Apoidea: Halictidae). *Linzer Biol. Beitr.*, **20**(2): 527-711.
- Ebmer, A.W., 1996. Asiatische Halictidae, 5. Daten zur Aculeaten-Fauna der Ussuri-Region unter Berücksichtigung der angrenzenden Gebiete (Insecta: Hymenoptera: Apoidea: Halictidae: Halictinae). *Linzer Biol. Beitr.*, **28**(1): 261-304.
- Ebmer, A.W., 2005. Zur Bienenfauna der Mongolei. Die Arten der Gattungen *Halictus* Latr. und *Lasioglossum* Curt. (Insecta: Hymenoptera: Apoidea: Halictidae: Halictinae). *Linzer Biol. Beitr.*, **37**(1): 343-392.
- Fahringer, J. & H. Friese, 1921. Eine Hymenopteren-Ausbeute aus dem Amanusgebirge (Kleinasien und Nordsyrien, südl. Armenien). *Archiv Naturg. Abt. A*, **87**(3): 150-176.
- Fan, J., 1991. A study on Chinese subgenera *Vestitohalictus* and *Seladonia* with description of new species (Apoidea: Halictidae). *Acta Entomol. Sinica*, **34**(1): 478-482. [In Chinese].
- Friese, H., 1916. Die Formen des *Halictus quadricinctus* F., sowie einige neue *Halictus* Arten der paläarktischen Region (Hym.). *Dt. Entomol. Z.*, **1916**(1): 25-34.
- Fukuda, H., Sakagami, S., Yamauchi, K. & T. Matsumura, 1973. Biofaunistic survey of wild bees in Hama-Koshimizu, eastern Hokkaido. *Japan. J. Ecol.*, **23**(4): 160-170. (In Japanese.)
- Gussakovskij, V., 1932. Verzeichnis der von Herrn Dr R. Mal-

- aise im Ussuri und Kamtschatka gesammelten aculeaten Hymenopteren. *Arkiv Zool.*, **24A**(10): 1-66.
- Hirashima, Y. (Supervisor), 1989. *A Check List of Japanese Insects*. Fukuoka: Entomological Laboratory of the Faculty of Agriculture, Kyushu University, xi + 1767 pp.
- Ikudome, S., 1978. [A wild bee survey in Kôchi Plain (Kôchi Pref.), Shikoku, Japan (Hymenoptera, Apoidea)]. *Kontyû*, **46**(3): 512-536. (In Japanese.)
- Ikudome, S., 1981. [Floral records of eighteen species of halictid bees in Kôchi Plain, Shikoku, Japan (Hymenoptera, Halictidae)]. *Bull. Kagoshima Women's Junior College*, **16**(8): 159-162. (In Japanese.)
- Ikudome, S., 1992. The environment and the wild bee fauna of Natural Park in a city, with the result taken at Shiroyama Park in Kagoshima City, Japan, and with the appendix of a revised bee list recorded from the mainland of Kagoshima Prefecture (Hymenoptera, Apoidea). *Bull. Kagoshima Women's Junior College*, **27**: 99-135.
- Ikudome, S. & S. Nakamura, 1994. [Bees in Hiroshima Prefecture, Honshu, Japan (Hymenoptera, Apoidea).] *Miscel. Repts. Hiwa Mus. Nat. Hist.*, **32**: 1-18. (In Japanese.)
- Ikudome, S. & S. Nakamura, 1995. [Bees of Hiroshima Prefecture, Honshu, part 2, with special reference to the Gono-kawa Basin (Hymenoptera, Apoidea)]. *Miscel. Repts. Hiwa Mus. Nat. Hist.*, **33**: 49-60. (In Japanese.)
- Ikudome, S. & S. Nakamura, 1996. [Bees from the northern part of Hiroshima Prefecture and the western part of Shimanu Pref. (the Takatsu-gawa Basin), Honshu, Japan (Hymenoptera, Apoidea)]. *Miscel. Repts. Hiwa Mus. Nat. Hist.*, **34**: 171-180. (In Japanese.)
- Ikudome, S. & S. Nakamura, 1997. [Summary of bee survey in Hiroshima Prefecture, Japan (Hymenoptera, Apoidea)]. *Miscel. Repts. Hiwa Mus. Nat. Hist.*, **35**: 17-30. (In Japanese.)
- Iwata, M., 1997. [A wild bee survey in Setaura (Kumamoto Pref.), Kyushu, Japan (Hymenoptera, Apoidea)]. *Japan. J. Entomol.*, **65**(3): 635-662. (In Japanese.)
- Kim, M.-R., 1997. Systematic study of genus *Halictus* (Halictidae: Hymenoptera) in Korea. *Korean J. Apiculture*, **12**(1): 1-6.
- Michener, C.D., 1978. The classification of halictine bees: tribes and Old World nonparasitic genera with strong venation. *Univ. Kansas Sci. Bull.*, **51**(16): 501-538.
- Morawitz, F., 1874. Die Bienen Daghestans. *Horae Soc. Entomol. Ross.*, **10**(2/4): 129-189.
- Morawitz, F., 1876. [Bees (Mellifera). II. Andrenidae In *Travel to Turkestan by ... A.P. Fedchenko*. No. 13, t. 2. Zool. Res. Pt 5, book 2]. *Izvestia Imp. Obshchestva Lyubitelei Estestvoznania, Etnographii i Antropologii*, **21**(3): 161-304. (In Russian.)
- Morawitz, F., 1880. Ein Beitrag zur Bienen-Fauna Mittel-Asiens. *Bull. Acad. Imp. Sci. St.-Petersbourg*, **26**: 337-389.
- Morawitz, F., 1890. Insecta a cl. G. N. Potanin in China et in Mongolia novissime lecta. XIV. Hymenoptera aculeata II, III. Apidae. *Horae Soc. Entomol. Ross.*, **24**(3-4): 349-385.
- Moure, J.S., 1940. Apoidea Neotropica. *Arquivos Zool. Estado São Paulo*, **2**: 39-64, pls. I-III.
- Niu, Z.-q., Y.-r. Wu & D.-w. Huang 2004. A taxonomic study on the subgenus *Seladonia* (Hymenoptera: Halictidae) in China with a description of a new species. *Zoological Studies*, **43**(4): 647-670.
- Okabe, K., 1939. Einige in der Nordmadschurei gefangene Hymenopteren (Vespoidea und Apoidea). *Trans. Kansai Entomol. Soc.*, **8**: 21-24.
- Pauly, A., 1997. *Paraseladonia*, nouveau genre cleptoparasite afrotropical (Hymenoptera Apoidea Halictidae). *Bull. Inst. R. Sci. Nat. Belgique Entomol.*, **67**: 91-99.
- Pauly, A., 1999. Classification des Halictini de la Région Afrotropicale (Hymenoptera Apoidea Halictidae). *Bull. Inst. R. Sci. Nat. Belgique Entomol.*, **69**: 137-196.
- Pérez, J., 1895. *Espèces nouvelles de mellifères de Barbarie (Diagnoses préliminaires)*. Bordeaux: Gounouihou, 64 pp.
- Pérez, J., 1903. *Espèces nouvelles de mellifères (palaearctiques)*. *Proc.-verb. Séances Soc. Linn. Bordeaux*, **58**: ccviii-ccxxxvi.
- Pérez, J., 1907. Mission J. Bonnier et Ch. Pérez (Golfe Persique, 1901). II. Hyménoptères. *Bull. Sci. France Belgique*, **41**: 485-505.
- Pesenko, Yu.A., 1984. [The bees of the genus *Halictus* Latreille sensu stricto (Hymenoptera, Halictidae) of Mongolia and northwestern China, with a review of publications on the Halictini of this region and with a revision of the subgenus *Prohalictus* of the World fauna]. pp. 446-481. In Korotyaev, B.A. (ed.). *Insects of Mongolia*, vol. 9. Leningrad: Nauka. (In Russian.)
- Pesenko, Yu.A., 2000. Phylogeny and classification of the family Halictidae revised (Hymenoptera: Apoidea). *J. Kansas Entomol. Soc.*, (1999), **72**(1): 104-123.
- Pesenko, Yu.A., 2004. The phylogeny and classification of the tribe Halictini, with special reference to the *Halictus* genus-group (Hymenoptera: Halictidae). *Zoosyst. Ross.*, **13**(1): 83-113.
- Pesenko, Yu.A., 2005. Contributions to the halictid fauna of the Eastern Palaearctic Region: genus *Halictus* Latreille (Hymenoptera: Halictidae, Halictinae). *Far Eastern Entomol.*, **150**: 1-24.
- Pesenko, Yu.A., Banaszak, J., Radchenko, V.G. & T. Cierzniaak. 2000. *Bees of the Family Halictidae (Excluding Sphecoides) of Poland: Taxonomy, Ecology, Bionomics*. Bydgoszcz: Pedagogical University, ix + 348 pp.
- Pesenko, Yu.A. & N.G. Davydova, 2004. [Bee fauna (Hymenoptera, Apoidea) of Yakutia. 2]. *Entomol. Obozrenie*, **83**(3): 684-703. (In Russian.)
- Proshchalykin, M.Yu., 2003. The bees (Hymenoptera, Apoidea) of the Kuril Islands. *Far Eastern Entomol.*, **132**: 1-21.
- Proshchalykin, M.Yu., 2004. A check list of the bees (Hymenoptera, Apoidea) of the southern part of the Russian Far East. *Far Eastern Entomol.*, **143**: 1-17.
- Proshchalykin M.Yu., & A.N. Kupianskaya, 2005. The bees (Hymenoptera, Apoidea) of the northern part of the Russian Far East. *Far Eastern Entomol.*, **153**: 1-39.
- Proshchalykin, M. Yu., Lelej, A.S., & A.N. Kupyanskaya, 2004. [The bee fauna (Hymenoptera, Apoidea) of Sakhalin Island]. pp. 154-192. In Storozhenko, S.Yu. (ed.). *The Flora and Fauna of Sakhalin Island. Proceedings of the International Project. Pt 1*. Vladivostok: Dalnauka. (In Russian.)
- Radoszkowski, O., 1876. Matériaux pour servir a une faune hyménoptérologique de la Russie. (Suite). *Horae Soc. Entomol. Ross.*, **12**(1): 82-100.
- Radoszkowski, O., 1893. Fauna hyménoptérologique

- transcaspienne. (Suite et fin). *Horae Soc. Entomol. Ross.*, **27**(1-2): 38-81.
- Robertson, C., 1918. Some genera of bees (Hym.). *Entomol. News*, **29**: 91-92.
- Sakagami, S.F. & A. Ebmer, 1979. *Halictus (Seladonia) tumulorum higashi* ssp. nov. from the northeastern Palaearctics (Hymenoptera: Apoidea: Halictidae). *Kontyû*, **47**(4): 543-549.
- Sakagami, S.F. & A. Ebmer, 1987. Taxonomic notes on Oriental halictine bees of the genus *Halictus* (subgen. *Seladonia*) (Hymenoptera Apoidea). *Linzer Biol. Beitr.*, **19**(2): 301-357.
- Sakagami, S.F. & H. Fukuda, 1972. [Autumn bee fauna in Hokkaido University Uryû and Nakagawa Experiment Forests]. *Res. Bull. College Experiment Forests, College Agriculture, Hokkaido Univ.*, **29**(1): 1-24. (In Japanese.)
- Sakagami, S.F. & H. Fukuda, 1973. Wild bee survey at the Campus of Hokkaido University. *J. Fac. Science, Hokkaido Univ., Ser. 6, Zool.*, **19**: 190-250.
- Smith, F., 1853. *Catalogue of Hymenopterous Insects in the Collection of the British Museum. Part I. Andrenidae and Apidae*. London: British Museum of Natural History. 195 pp., pls. I-VI.
- Smith, F., 1873. Descriptions of aculeate Hymenoptera of Japan, collected by Mr. George Lewis at Nagasaki and Hiogo. *Trans. R. Entomol. Soc. London*, **1873**(2): 181-206.
- Smith, F., 1879. *Descriptions of New Species of Hymenoptera in the Collection of the British Museum*. London: British Museum, xxi + 240 pp.
- Strand, E., 1909. Die paläarktischen *Halictus*-Arten des kgl. zoolog. Museums zu Berlin; z. T. nach Bestimmungen von J.D. Alfken. *Archiv Naturg. Abt. A*, **75**(1): 1-62.
- Strand, E., 1910. Neue süd- und ostasiatische *Halictus*-Arten im kgl. zoologischen Museum zu Berlin. (Hym., Apidae). *Berliner Entomol. Z.*, (1909), **54**(3-4): 179-211.
- Strand, E., 1914. H. Sauter's Formosa-Ausbeute. Apidae II. (Die *Halictus*-Arten von Formosa). *Archiv Naturg. Abt. A*, (1913), **79**(12): 147-171.
- Strand, E., 1921. Apidologisches, insbesondere über paläarktische *Halictus*-Arten, auf Grund von Material des Deutschen entomologischen Museums. *Archiv Naturg. Abt. A*, **87**(3): 305-322.
- Usui, M., Nishijuma, Y., Fukuda, H. & S.F. Sakagami, 1976. A wild bee survey in Obihiro, eastern Hokkaido. *Res. Bull. Obihiro Univ.*, **10**: 225-251.
- Vachal, J., 1892. [Parmi les hyménoptères recueillis au Soudan oriental par M. le Dr. Paul Magretti: quelques *Halictus* et une espèce de *Prosopis*]. *Bull. Soc. Entomol. France*, **1892**: cxxxv-cxxxvii.
- Warncke, K., 1973. Zur Systematik und Synonymie der mitteleuropäischen Furchenbienen *Halictus* Latreille (Hymenoptera, Apoidea, Halictidae). *Bull. Soc. R. Sci. Liège*, **42**(7-8): 277-295.
- Warncke, K., 1975. Beitrag zur Systematik und Verbreitung der Furchenbienen in der Türkei (Hymenoptera, Apoidea, *Halictus*). *Polskie Pismo Entomol.*, **45**(1): 81-128.
- Warncke, K., 1982. Beitrag zur Bienenfauna des Iran, 14. Die Gattung *Halictus* Latr., mit Bemerkungen über bekannte und neue *Halictus*-Arten in der Westpaläarktis und Zentralasien. *Boll. Mus. Civ. Storia Nat. Venezia*, (1981), **32**: 67-166.
- Warncke, K., 1984. Ergänzungen zur Verbreitung der Bienen-gattung *Halictus* Latr. in der Türkei (Hymenoptera, Apidae). *Linzer Biol. Beitr.*, **16**(2): 277-318.
- Warncke, K., 1988. Isolierte Bienenförmigkeit. *Linzer Biol. Beitr.*, **20**(1): 83-117.
- Yamada, M., Munakata, M. & S.F. Sakagami, 1990. [Non-parasitic halictid bees in Shimokita and Nambu Districts (Aomori Prefecture), northernmost Honshu]. *J. Aomori-ken Biol. Soc.*, **27**: 35-40. (In Japanese.)
- Yasumatsu, K., 1934. Les Hyménoptères de l'île Yakushima. *Mushi*, **7**(2): 61-67.
- Yasumatsu, K., 1937. [Hymenoptera of Tsushima (First Report)]. *Fukuoka Hakubutsugaku Zasshi*, **2**: 59-74. (In Japanese.)
- Yasumatsu, K. & G. Narisada, 1935. Miscellaneous notes on the hymenopterous fauna of South Manchuria. (First report). *Mushi*, **8**(2): 64-82.